Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan

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DEVELOPMENT AND EVALUATION OF PSYCHOMETRIC PROPERTIES OF THE CHINESE VERSION OF THE PROFESSIONAL PRACTICE ENVIRONMENT SCALE IN TAIWAN

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ABSTRACT

Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan

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In Taiwan, the ability to measure the changing of health care reform and the improvement in nursing practice environment is hindered by the lack of a valid, reliable, and culture-sensitive instrument for measuring nursing practice environment. The purposes of this two-phase study were to translate and psychometrically validate the Chinese versions of the PPE Scale (CPPE).

Phase I focused on translating and adapting the 38-item PPE into CPPE and evaluating the semantic and content equivalency. Semantic equivalence of the CPPE was secured using Translation Validity Indices as judged by American and bilingual experts. The content equivalence of the CPPE was supported by the satisfactory Content validity Indices. To increase the cultural sensitivity and comprehensiveness of the CPPE, 27 items were added at the suggestion of Taiwanese experts following content validation. A 66-item CPPE including 38 PPE items, 1 adapted item and 27 new items was produced for psychometric evaluation.

Phase II focused on establishing the psychometric properties of the CPPE. A cross-sectional survey was conducted to test the 66-item CPPE on 977 Taiwanese nurses working in acute care settings. PCA with Varimax rotation on the 38 PPE items produced an eight-component solution for the 36-item CPPE after deleting two items. Cronbach's

alpha was .90 for the total 36-item CPPE and .68 - .87 for the eight subscales. PCA with Varimax rotation on 66 items of the CPPE produced an eleven-component solution for the 58-item CPPE after deleting 8 items. Cronbach's alpha was .95 for the total 58-item CPPE and .71 - .87 for the eleven subscales. Both the 36-item CPPE and the 58-item CPPE demonstrated satisfactory test-retest reliability and concurrent validity. The psychometric structures of the 36-item CPPE and the 58-item CPPE were different from the original PPE.

Both the 36-item CPPE and the 58-item CPPE were reliable and valid, but the 58-item CPPE is culturally sensitive to the Taiwanese nurses. The 58-item CPPE is useful for measuring Taiwanese nursing practice environment.

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CHAPTER I

INTRODUCTION

Environment, one of four major concepts in the domain of nursing knowledge (Fawcett, 2003), is a prominent issue in the development of nursing administration theory and practice (Farley & Nyberg, 1990). The environment of nursing professional practice is the central focus for this research investigation. This discussion focuses on the background and the present practice environment for nurses in Taiwan is introduced. The purposes and research questions are proposed. The significance and limitations of the present study are elaborated.

Background

The Taiwanese health care system has been facing serious challenge for the past two decades. Since the government signed into law a regulation for hospital accreditation in 1986, the focus on quality health care has increased in Taiwan (Chen, 1996). With the implementation of National Health Insurance (NHI) in 1995, the health care system in Taiwan has undergone another tremendous challenge. Today, NHI is playing the role of major payer to health care organizations. NHI's policies and reforming the payment system for health care organizations have created a powerful impact on the health care system. The current Taiwanese health care system is focused on cost-containment within the structure of NHI policies (Chien, 2002). Furthermore, the distribution of health resources for health care organizations has also been regulated by the government based on the results of hospital accreditation (Chen, 1996). Consequently, in order to compete with peers and survive under current health care policies, hospitals in Taiwan must not

only ensure the quality of heath care but also demonstrate efficient management of costs.

Similar to Western countries, emphasis on increased productivity and efficiency for survival in a marketplace are driven by cost-control and effective use of resources. To accomplish this, various strategies such as redesign, restructuring, merging, and downsizing have been popularly implemented in Taiwanese hospitals (Kung, Shaw, & Yin, 2003). Under the pressure of cost-containment, reducing the nursing workforce has been viewed as a strategy for controlling costs in most health care settings. Since nurses make up the largest proportion of health providers in most hospitals, they are vulnerable to this outcome (Yin & Yang, 2002; Yin, Yang, & Liu, 2001). The president of the Taiwan Nurses Association recently pointed out that nursing manpower and quality of nursing care in Taiwan have been threatened by the deterioration of nurses' practice environment under the current cost-oriented health care system. She has called for improving the nurses' work environments in order to retain nurses and to improve the nursing's professional practice environment (Lee, 2003).Today, the quality and safety of Taiwanese nurses' practice environments are being critically challenged by complex contextual factors including health policies, shrinking health care budgets, consumers' increasing demands for the quality of health services, and the constrained nursing manpower.

Transitions in health care have globally sparked public and professional concern regarding the professional practice environment for nurses and its effect on the quality of care (Stone et al., 2003). According to the report in U. S, *Keeping Patients Safe: Transforming the Work Environment of Nurses,* patient safety is threatened by the effect

of nurses' work environments on nursing care (Institute of Medicine, 2003). Empirical findings from research in Western countries have generated a body of evidence that suggests nurses' professional practice environments are significantly related to nurse and patient outcomes (Aiken, Clarke, & Sloane, 2002; Aiken, Clarke, Sloane, Sochalski, & Silber, 2002; Aiken, Clarke, Sloane, & Sochalski, 2001; Aiken, Clarke, Sloane, Sochalski et al., 2001; Aiken & Sloane, 1997; Aiken, Sloane, & Klocinski, 1997; Aiken, Sloane, & Lake, 1997; Aiken, Smith, & Lake, 1994; Aiken, Sochalski, & Lake, 1997; Clarke, Rockett, Sloane, & Aiken, 2002; Clarke, Sloane, & Aiken, 2002; Kramer & Schmalenberg, 1991a, 1991b, 1991b; Laschinger, Shamian, & Thomson, 2001; Sochalski, 2001; Upenieks, 2002, 2003; Vahey, Aiken, Sloane, Clarke, & Vargas, 2004). Reports note that organizational structure influences outcomes for both patients and nurses by creating a more or less supportive environment for nursing care (Aiken et al., 1997; Aiken, Sloane, & Sochalski, 1998; Aiken et al., 1994; Aiken et al., 1997).

Statement of the Problem

Nursing professionals have been increasingly involved in activities that demonstrate their contributions to patient outcomes (Doran, 2003; Rantz, Bostick, & Riggs, 2002). Stone and her colleagues (Stone et al., 2003) highlighted that further evaluation of nurses' work conditions and hospital characteristics are needed as a focus of outcomes research. Aiken and Patrician (2000) reported that organizational research is important in evaluating the impact of nursing on patient care. However, instruments and methods for studying organizational factors in nursing outcomes research still have

lagged behind other areas.

Nurses in a work environment without support for performing professional practice have difficulty knowing patients and are compromised in the delivering of safe, effective, and timely care for patients (Institute of Medicine, 2003). Farley and Nyberg (1990) emphasized the necessity for describing and analyzing nurses' practice environments and the relationships among these environments, the well-being of employees, and organizational outcomes in the development of nursing administration theory and practice. Specifically, they indicated that instruments developed to measure the nursing practice environment are essential to answer questions about the nursing practice environments and its relationship to organizational outcomes. Unfortunately, an instrument for measuring the professional practice environment for Taiwanese nurses is currently not available.

Though some reliable and valid instruments have been developed and applied in clinical practice for measuring nursing practice environment (Aiken & Patrician, 2000; Ives Erickson, et al., 2004; Lake, 2002; Nolan, Lundh, & Brown, 1999; Whitely & Putzier, 1994), these instruments are rooted in English speaking countries and have not been translated into Chinese. The evaluation of Taiwanese nurses' professional practice environment in acute care settings is hindered by the absence of a valid and reliable measurement that employs Chinese language and is culturally sensitive. The lack of a valid and reliable instrument sensitive to the Taiwanese culture for measuring nurses' professional practice environment leads to difficulty in constructing longitudinal

evaluations of Taiwanese nurses' practice environments and in further linking organizational research to outcomes research. This leads to the necessity of developing a reliable and valid instrument as the first priority in developing a research program of professional practice environment in Taiwan.

Purposes of the Study

The purposes of this methodological study were:

1. To translate the Professional Practice Environment Scale (PPE) from English to Chinese
2. To evaluate the equivalencies across the translated Chinese version of the PPE Scale with the English version of the PPE Scale
3. To adapt the translated Chinese version of the PPE Scale as needed to produce a culturally sensitive instrument
4. To evaluate psychometric properties of the translate-adapted Chinese version of the PPE Scale in Taiwanese nurses working in acute care settings.
5. To determine the extent to which selected demographics explain Taiwanese nurses' perceptions of their professional practice environment

Research Questions

The proposed research questions derived for the purposes of this study were:

1. To what extent can the equivalence of the translate-adapted Chinese version of the PPE Scale as relative to the English version of the PPE Scale be demonstrated through the use of translation and adaptation techniques?

2. To what extent can the psychometric properties of the translate-adapted Chinese version of the PPE Scale be demonstrated in a sample of Taiwanese nurses working in acute care settings?
3. To what extent do selected demographics and variables explain Taiwanese nurses' perceptions of their professional practice environment ?

Research Hypotheses

The following research hypotheses were proposed:

1. The translate-adapted Chinese version of the PPE Scale demonstrates semantic, content, and conceptual equivalence as relative to the English version of the PPE Scale
2. The translate-adapted Chinese version of the PPE Scale demonstrates acceptable psychometric properties in a sample of Taiwanese nurses working in acute care settings
3. There are significant relationships between the total scores of the translate-adapted Chinese version of the PPE Scale and selected demographics which are age, months of being a nurse, months of working on the unit, months of working in the hospital, martial status, educational degree, work position, studying for a degree, rank, work unit, salary as a major source of family income, and monthly salary and variables which include work load, continuously monitor and observe patient, nursing department recognizes nurses' contribution to patient care, non-nursing department recognizes nurses'

contribution to patient care, nursing department supports nursing practice, and non-nursing department support nursing practice

Definition of Terms

The variables in this study were defined as follows:

Equivalence refers to the agreement between two measures of the same construct. (Chang, Chau, & Holroyd, 1999) In this study, semantic, content, and conceptual equivalence are the emphases. Semantic equivalence is measured by the Translation Validity Index (TVI), face validity and parallel forms reliability. Content equivalence is measured by the Content Validity Index (CVI). Concept equivalence is measured by principal components analysis.

Chinese represents the language of Mandarin written in traditional Chinese characters.

Professional practice environment scale (PPE) refers to an instrument that is designed in English to measure nurses' work settings (Ives Erickson et al., 2004).

Translation techniques refer to methods used to produce an instrument from source language to targeted language and include translation/back translation, committee approach, bilingual method, monolingual method and pretest method (Banville, Desmsiers, & Genet-Volet, 2000; Behling & Law, 2000a; Brislin, 1970; Cruz, Padilla, & Agustin, 200)

*Psychometric propertie*s refer to elements that account for the competence of a measurement in terms of reliability and validity. In this study, reliability is determined by

test-retest reliability and internal consistency reliability; and validity is determined by face validity, content validity and construct validity.

The translated-adapted Chinese version of the Professional Practice Environment Scale represents an instrument that is produced through translating the original English version of the PPE Scale into the language of Mandarin written in traditional Chinese characters and revising the translated instrument to fit in respondents' culture.

Taiwanese nurses refer to registered nurses who work in a selected hospital in Taiwan at the time of the study.

Acute care settings refer to nurses' work settings in a selected teaching hospital in the Northern area of Taiwan that provides acute medical services for patients.

Professional practice environment refers to a health care setting where core elements are demonstrated, which include ″professional staff leadership and autonomy in practice; control over practice; interdisciplinary communication and teamwork; use of a problem-solving approach to handle disagreements and conflict, enhanced internal work motivation; and delivering culturally sensitive, competent care to patients of all ethnic groups″(Ives Erickson, et al., 2004, p.281). A professional practice environment is measured by the Professional Practice Environment Scale (PPE).

Assumptions

Assumptions of the present study included:

1. Nurses' professional practice environment can be measured by nurese' reports of their perceptions of their professional practice environment.

2. Individuals can honestly self report their perceptions of their professional practice environments.
3. People are comfortable enough without pressure to reflect true feelings.
4. The uses of translation techniques combined with translation/back translation, committee approach, bilingual method and the implementation of pretest in monolingual and bilingual individuals are appropriate methods for producing the Chinese version of the Professional Practice Environment Scale.
5. The panel of experts can identify the appropriateness of the use of the original Professional Practice Environment Scale within Taiwanese culture.

Limitations of the Study

Limitations of this study were identified as followings:

1. The attention of the present study was limited to psychometric evaluation of the translated-adapted Chinese version of the Professional Practice Environment Scale with Taiwanese nurses working in four study hospitals in Taiwan and did not address all the factors that contribute to the results of nurses' perceptions of their professional practice environments.
2. Not all of the elements of professional practice environment, which might be important in Taiwanese culture, could be completely addressed in the translated-adapted Chinese version of the Professional Practice Environment Scale.
3. The use of self-report for measurement is subjective. A respondent's

perception of the professional practice environment may not reflect the true reality.

4. The measurement of respondent's perception of the professional practice environment was constructed in a cross-sectional period and mgint be influenced by circumstances at the point of testing.
5. The translated-adapted Chinese version of the Professional Practice Environment Scale was tested with nurses who worked in the four study hospitals in Taiwan. Thus, the findings were unable to be generalized beyond the sample population.

Significance

The issue of nursing practice environment has been emphasized in Western countries for a long time due to the increasing nursing shortage. According to the results of the ″Magnet Hospital″studies, hospitals constructing an environmental context filled with support for nursing practice are critically associated with nurses' recruitment and retention (McClurr, & Hinshaw, 2001, McClure, Poulin, D., & Wandelt, 1983; Scott, Sochalski, & Aiken, 1999). In an effort to resolve the nursing shortage, strategies that address nurses' practice environments have been highlighted (Aiken, Clarke, Sloane, Sochalski et al., 2001).

A white paper entitled *Hallmarks of the Professional Nursing Practice Environment* published by American Association of Colleges of Nursing (AACN, 2002) described that improving nurses' practice environment is an important issue in this era of increasing health care workforce shortage. AACN claimed that professional nursing

practice is supported and optimized within an environment that supports professional practice. A professional practice environment emphasizes quality, safety, interdisciplinary collaboration, recognizes the value of nurses' expertise on clinical care quality and patient outcomes, values nursing autonomy and control over practice, and creates collaborative relationships among members of the health care team. When nurses practice their full potential to use professional knowledge and skills within a professional practice environment, they will increasingly satisfy with their practice. This can improve their retention and help attract more individuals into nursing (AACN, 2002). Moreover, Aiken and colleagues' research demonstrated that the emergence of a supportive professional practice environment contributes to positive health outcomes (Aiken, Clarke, & Sloane, 2002; Aiken, Clarke, Sloane et al., 2002; Aiken, Sloane, Lake, Sochalski, & Weber, 1999).

Strategies that will improve the nursing profession and thereby ensure that consumers have access to high-quality nursing care have been proposed in a national plan entitled *Nursing's Agenda for the Future* (American Nurses Association, 2002). The nurses' work environment is singled out as one of the top four priorities of the 10 important issues within the plan. The steering committee of the plan argues that improving nurses' work environment is necessary for the nursing profession to optimize quality patient care and to retain professional.

Nursing professional practice has been challenged in the current cost-constrained hospital environment. Nurses in many countries have reported that nursing profession's

ability to deliver nursing care is compromised by the changing working condition (Aiken, Clarke, Sloane, Sochalski et al., 2001; Duffield & O'Brien-Pallas, 2002; Goodin, 2003). Within this changing work climate, nurses experience increases in workload and non-nursing tasks and a decrease in optimizing professional practice activities. This work climate leads to the nursing shortage (Goodin, 2003). In order to survive under the cost-constrained environment, restructuring and reengineering are widely used by many hospitals. However, Aiken and colleagues' research provides evidence that the restructuring and reengineering strategies have negative impacts of on clinical care and patient outcomes. Their work speaks to the serious erosion in the nursing practice environment over time, even in the magnet hospitals, under the restructuring and reengineering health system in America (Aiken, Clarke, & Sloane, 2000).

Hospitals in other countries have experienced organizational changes, especially in the nursing workforce. Nurses in other countries have been challenged by the deterioration of the practice environment. Further research on the impact of organizational changes in nursing workforce on quality of care is important (McKee, Aiken, Rafferty, & Sochalski, 1998).

The American Academy of Nursing (AAN) convened a conference of nursing leaders in health care workforce research and policy in October 31, 2002. Conference leaders invited experts in health care workforce research and policy and key representatives for nursing organizations, who involved in health care workforce projects and policy issues to describe the gaps in both research and public policy on issues of

importance to the future of the nursing workforce. The participants in this conference identified six critical themes for nursing leaders to exercise responsible leadership in developing research agendas, public-private partnerships, and public policy. The consensus view from this conference suggested advocating initiatives that improve the health of the public. The strategy of improving working conditions and the delivery system environment across settings was proposed. Furthermore, the importance of employing nursing resources in more efficient and effective ways was advocated. Experts claimed research and evaluation of the different nursing practice and care delivery models is an important strategy. Moreover, the importance of creating a database to monitor nurses' work environment, measure the correlations between staffing and patient outcomes, and support policy development were suggested by these experts (Disch, Sochalski, & Seamon, 2004). Creating a tool that can be used to evaluate data overtime can effectively be used to make improvements in the practice setting and evaluate effectiveness of these improvements.

To implement initiatives that support professional nursing practice is a critical issue for policy makers, because professional nursing practice not only influences patient outcomes but also enhances hospital's competitive position (Ritter- Teitel, 2002). In order to optimize outcomes for nurses, patients and organizations, it is important for administrators to create a supportive work environment where professional nursing practice can be unfold. Currently, innovative redesign in nursing practice is widely viewed as a necessary strategy for an organization to survive under the current health care

system. However, the effectiveness in achieving the intended outcomes and the improvement of the efficacy of overall care for patients determine the meaning of the innovation (Babington, 1993). The evaluation of the effects of management actions and decisions for any proposed or implemented change has become especially critical for nurse executives and administrators. In fact, a full cycle of evaluation of the practice environment is warranted. This includes initial baseline measurements for current practice, identification of areas for improvement, design and implementation of strategies to produce effective change, and ongoing assessment of the effect of the strategies, can provide meaningful information for nurse executives and administrators to make an evidence-based decision to assure desired optimal outcomes (Capuano, Bokovoy, Halkins, & Hitchings, 2004; Grinde, Peterson, Kinneman, & Turner, 1996; Krugman & Preheim, 1999; Urden & Roode, 1997).

An environment without support for nurses for performing professional practice will hinder the delivery of good health care for patients. Consequently, nurses might become unsatisfied with the nursing profession or even leave jobs, and then patient safety and hospital's reputation would be threatened. Nurses' turnover cost is expensive (Jones, 1990b) and will impede the delivery of quality patient care (Tai & Robinson, 1998). In the current era of cost-containment in the health care system, the professional practice environment for nurses has become a global critical issue for the nursing discipline to meet the need of quality and cost control in the current health care system. However, the exploration of this work in Taiwan is very limited. The lack of culturally-sensitive

instruments to allow researchers, nursing administrators, executives, or policy makers to better understand current practice environments for nurses leads to the gap between research, practice, and policy. In order to improve better outcomes for organizations, the nursing profession and patients, the gaps in research, clinical practice and policy on the issue of nurses' professional practice environment in Taiwan need to be eliminated aggressively.

Limited information about nurses' practice environment can limit nursing executives; administrators and policies makers' ability to gain insights about the effect of implanted strategies and their impacts on nurse and patient outcomes to make evidence-based decisions. Laschinger and colleagues (2001) pointed out that policy and decision makers need to assure nurses' work environments foster both nurses' and patients' satisfaction with care. In order to aggressively improve the nursing professional practice environment as well as nurse and patient outcomes, an instrument able to precisely capture nurses' professional practice environments for the hospital administrators and policy makers is critically needed.

Waltz, Strickland, & Lenz (1991) urge the use of existing instruments appropriate for nursing measurement to be developed/adapted, rather than to develop new ones. They claim that the use of existing instruments could enrich the knowledge base for evaluating the properties of the existing instruments and decrease the cost and the waste of time. A reliable and valid research instrument in one language might have difficulties in accurately measuring the similar phenomenon in different culture groups (Varricchio,

1997). Researchers engaged in cross-cultural research should be aware of the language barriers related to measurement issues instead of simply direct translation. The lack of a valid and reliable instrument to truly reflect the target phenomenon could lead to inaccurate research conclusions. Poor translations of a survey instrument can threaten the value of the data gathered from it. Carefully performing translation techniques is essential for producing a reliable and valid instrument for cross-cultural research (Banville, Desrosiers, & Genet-Volet, 2000; Behling & Law, 2000b).

In an effort to overcome the gap between research, practice, and policy, this study will produce a valid and reliable instrument, the Chinese version of the PPE Scale, through rigorous translation techniques to construct the access to explore nurses' professional practice environment in Taiwan. According to The International Council of Nurses' (ICN) position statement, nurses have the obligation to use the results of research and trials to contribute to decisions on quality, cost-effective health care delivery. Nurses internationally are encouraged to conduct nursing and health research that contributes evidence to policy development (The International Council of Nurses, 1999). The development of a reliable and valid instrument which is sensitive to Taiwanese culture, could allow nursing administrators, executives and policy makers to have the opportunity to better understand and monitor the change of Taiwanese nurses' practice environments. By the better understanding of nurses' practice environments, it may be possible to develop a template to guide further evidence-based decision making. Findings that result from the use of the tool developed could truly reflect the context of nurses' practice

environments which are investigated. Moreover, hospital administrators and policies makers could use this culturally sensitive instrument to continuously monitor the change of nurses' professional practice environments after an innovation of administration is implemented. Consequently, hospital administrators and policies makers would have evidence from continuous evaluation to use when reforming nurses' practice environments and enhancing organizational imperatives to promote safe and quality of patient care. Better understanding of the current Taiwanese nurses' professional practice environments could also build a body of knowledge regarding Taiwanese nurses' practice environment. This knowledge can be used to influence organizational or national policy decisions to ensure the quality of patient care, prevent nursing from problems of insufficient workforce and inadequate work design and to enhance nursing professional performance in the long run. Furthermore, the development of this reliable and valid instrument may provide a link between organizational research and outcomes research in Taiwan. Continued intervention research relating to the effect of the implemented policies could also be explored that better leading to describe nursing impacts on patient outcomes in Taiwan.

The development of a well-translated questionnaire will help facilitate cross-cultural comparison research (Chang, Chau, & Holroyd, 19990. The comparison of the psychometric properties between the two versions of Professional Practice Environment Scales can augment knowledge for the original Professional Practice Environment Scale. Moreover, the comparison of the results of nurses' perceptions of

their practice environments between different countries could also allow nursing administrators, policy makers, executives to follow trends and make changes in improving the practice environments for nurses within the organizations.

Rigorous translation techniques and the methods of validating the equivalence and evaluating psychometric properties in this study can serve as an information base for further education programs related to cross-cultural research. These methodologies may also provide researchers a guideline in the translation of an instrument from source to another language with cultural equivalence. The translated instruments with cultural equivalence could enable researchers to explore and compare issues in different cultures. This can lead to the success of the development of cross-cultural research. The knowledge derived from cross-cultural research could also enrich nursing education programs related to cross-cultural studies. From the perspectives of health promotion, researchers around the world could use translated instruments with cultural equivalence to collaborate in exploring health issues in different cultural groups.

This cross-cultural exploration could enhance the likelihood of building a body of knowledge with cultural university and diversity for the given health issues. Ideally, this knowledge could further contribute to clinical practice through the development of an efficient global health promotion program from the syntheses of results with cultural unity and the development of culturally sensitive health promotion programs through the results related to cultural diversity. Consequently, this knowledge could also contribute to policy issues through providing policy makers information for evidence-based

decision-making. The body of knowledge with cultural unity and diversity for the given health issues could also provide fruitful information related to cross-cultural issues for nursing educators to enrich nursing educational programs.

Summary

Nurses make up the largest cohort of health providers. A professional practice environment is needed to enhance and optimize nurses' potentials to deliver quality patient care. Research supports the belief that the nurses' professional practice environment significantly relates to nurse and patient outcomes. The professional practice environment for nurses is an important topic of study across many health care systems. However, in Taiwan, the lack of a valid and reliable instrument to measure nurses' practice environments limits the further understanding of this critical issue. This study produces a reliable and valid instrument with cultural-sensitivity to provide better understanding of Taiwanese nurses' practice environment and to continuously evaluate the feasibility and effectiveness of clinical policies related to the professional practice environments. A full cycle evaluation and improvement for the complex contextual relationships between policies, practice environments, nurse outcomes, and patient outcomes in Taiwan could be constructed in the long run. Accordingly, nurses could provide quality care in dynamic and satisfying environments where they could well utilize their professional skills and knowledge. The methodologies applied in this study could provide guidelines for instrument translation that could further facilitate the development of cross-culture research. The knowledge derived from cross-cultural

research could further contribute to optimizing clinical practice and policy making, and to provide educational information for nursing educators.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Nurses are indispensable to patient safety. Mitchell and Shortell (1997) pointed out that nursing actions such as ongoing monitoring patients' health status are directly related to better patient outcomes. Nurses need also to have an work environment that promotes use of disciplinary actions that optimizes nursing contributions to patient outcomes. However, in many settings the current work environment for nurses is characterized by many serious threats to patient safety and obstacles to implementing a nursing professional practice. Under a cost-control oriented health work environment where nurses can not spend enough time with patients, nursing professional performance will potentially decrease and patient's safety will be sacrificed. Needleman, Buerhaus, Mattke, Stewart, and Zelevinsky (2002) indicated that less nursing time with patients is associated with poor patient outcomes including higher rates of infection, gastrointestinal bleeding, pneumonia, cardiac arrest and death from these and other causes. Though environment has been viewed as one of the four major concepts in the domain of nursing knowledge including person, environment, health, and nursing, however, there is limited attention to develop the concept of environment (Kleffel, 1991). The erosion of the professional practice environment for nurses within the current restructuring health systems calls for increased attention to transforming nurses' practice environments in an effort to improve nursing's on patient and nurses outcomes. Hence, to better understand

nurses' practice environment is urgent for transforming the practice environment to allow nurses to perform professional practice to contribute to quality of patient care in the long run. The development of valid and reliable instrument is essential to help evaluate nurses' practice environment.

This chapter presents the concepts of professional practice environment, methodological issues regarding translating and adapting measurement instruments for cross-cultural research and establishing cultural equivalence. Finally, a framework guiding this study is proposed and elaborated.

Conceptualizations of Professional Practice Environment

Practice environment is ″a set of workplace features that, when present, enable nurses to demonstrate professional practice characterized by decision-making autonomy, clarity of mission, and organizational responsiveness.″(Estabrooks et al., 2002, p. 265). A nursing practice environment refers the organizational characteristics of a work setting that facilitate or constrain professional nursing practice (Lake, 2002). According To AACN (2002), the hallmark of the professional practice environment for nurses represents an optimal work setting in which patients are the central focus, nurses are supported to practice their full potential and the professional nursing practice are supported to achieve desired patient safety and outcomes.

Theoretical Underpinnings of Professional Practice Environment in Nursing

The development of the concept of nursing professional practice environment is grounded in conceptualization of magnet hospital. The finding of the Magnet Hospital

study indicated that the environment supportive of professional practice accounted for nurses' satisfaction and retention (McClure, Poulin, Sovie, & Wandelt, 1983; Scott, Sochalski, & Aiken, 1999). Hospitals designated as ″magnets″and reported by nurses to be good places to work had a common set of organizational attributes. These included effective and visible nursing leadership; decentralization of decision making to the level of the nursing unit, adequate staffing and flexible scheduling; responsible and providing for high quality nursing care; recognition of autonomy; support for nursing practice (McClure, et al., 1983). Magnet hospitals created a good professional practice environment for nurses, so that they could remain successful in attracting and retaining professional nurses, despite cyclical national and regional shortages of nurses (Kramer & Schmalenberg, 1988a; 1988b).

Gordon (1997) claimed that nursing care depends on education, experience and the institutional support received from the hospital rather than on personal kindness or the nurse's moral virtuousness. Gordon argued that the work environment require support from the hospital and decent relationships with doctors. Kramer and Schmalenberg (1991a, 1991b) identified trends and documented the difference of characteristics between magnet hospital and non-magnet hospitals and nurses' responses. Magnet hospital nurses were more satisfied with all aspects of their job and reported adequate to excellent staffing levels when compared with non-magnet hospital nurses. In addition, magnet hospital nurses reported higher RN-to-patient ratios and lower turnover rates (Kramer & Schmalenberg, 1991a), more discretionary power, particularly at the unit level,

higher esteem, and more satisfaction with the management style at their hospital and the quality of leadership (Kramer & Schmalenberg, 1991b). Magnet hospitals construct an environmental context filled with support for nursing practice. Such practice environment for nurses is critically associated to nurses' recruitment and retention.

Components of Professional Practice Environment

McClure and colleagues (1983) constructed the original Magnet Hospital study to identify and describe the characteristics of magnet hospitals reputed by nurses as good places to work. They identified multiple organizational attributes of magnetic hospitals associated with creating a good work place for nurses. These attributes were categorized into three broad categories including include administration, professional practice, and professional development. As related to the administration aspect, five elements: management style, quality of leadership, organizational structure, staffing, and personnel policies were identified. Three elements related to professional practice were quality of patient care, teaching, and image of nursing. Four elements related to professional development included orientation, inservice-continuing education, formal education, and career development.

Latter, Kramer and Schmaleberg (1988a, 1988b) designed several research studies under the original magnet hospital study. They compared 16 magnet hospitals with the best run companies in the corporate community and ascertained characteristics of the hospitals. They indicated that magnet hospital created a good internal work environment with values of quality of care, nurse autonomy, good communication, innovation, value

of education, respect and caring for the individual, and endeavor for excellence to effectively dealt with the external problem of nursing shortage. Kramer and Schmalenberg (2001, p.26) described that ″a magnet hospital is one that attracts and retains nurses who have high job satisfaction because they can give quality of care ″. They identified eight essentials to allowing nurses to give quality of care in hospitals (see Table 1). Aiken (2001) argued that adequate resources, administrative support, and nurse-physician relations play important roles in creating professional practice environment.

AACN (2002) addressed that the need of knowledgeable and skilled professional nurses is especially critical in the era of increasing health care workforce shortage in order to maintain high-quality professional nursing care to meet the need of population and health care system. AACN (2002) claimed that the good professional practice environment for nurses should always put the patient first and focus on patient safety and care quality. AACN (2002) indicated that professional nursing practice is supported and optimized under the hallmarks of the practice setting. Eight hallmarks of the professional nursing practice environment were proposed by AACN (2002) (see Table 1).

In conclusion, an optimal professional practice environment for nurses are a setting that supports nurses to perform professional judgment, knowledge and skill with focus on patient issues as the first priority to provide quality of care.

Table 1

Components of Professional Practice Environment

Kramer and Schmalenberg (2001)	AACN (2002)
1. Working with other competent nurses	1. Manifesting a philosophy of clinical care emphasizing quality, safety, interdisciplinary collaboration, continuity of care, and professional accountability
2. Good nurse-physician relationships and communication	2. Recognizing contributions of nurses' knowledge and expertise to clinical care quality and patient outcomes
3. Nurse autonomy and accountability	3. Promoting executive level nursing leadership
4. Supportive nurse manager-supervisor	4. Empowering nurses' participation in clinical decision-making and organization of clinical care systems
5. Control over nursing practice and practice environment	5. Maintaining clinical advancement programs based on education, certification, and advanced preparation
6. Support for education	6. Demonstrating professional development support for nurses
7. Adequate nurse staffing	7. Creating collaborative relationships among members of the health care provider team
8. Concern for the patients is paramount	8. Utilizing technological advances in clinical care and information systems

Relationships between Professional Practice Environment, Nurse and Patient Outcomes

Aiken and her colleagues argued that organizational structure influences outcomes for both patients and nurses through creating a more or less supportive environment for nursing care (Aiken, Sloane, & Lake, 1997; Aiken, Sloane, & Sochalski, 1998; Aiken, et al., 1994; Aiken, Sochalshi, & Lake, 1997). Research evidence indicated that organizational support for nursing care affects job dissatisfaction, burnout directly and independently; and nurses' job dissatisfaction and burnout are related to their reports of quality of care. The probability of reporting low quality of care by nurse with high organizational support was three times than those with low organizational support (Aiken, Clarke, Sloane, Sochalski et al., 2001). Moreover, evidence that nurses were more likely to experience burnout and job dissatisfaction in hospitals with high patient-to-nurse ratios, and patients were more likely to experience higher risk-adjusted 30-day mortality under reported by Aiken, Clarke, Sloane et al. (2002). Researches in magnet hospitals indicated that the nursing shortage could be dealt by providing supportive work environment. The aspects of work environment with excellent attributes could eliminate internal nurse turnover and satisfy nurses who work there(Kramer & Schmalenberg, 1991a, 1991b). Examination of the internal work environment and organizational culture has been encouraged to retain high-quality nurses (Corcoran, Meyer, & Magliaro, 1990). If hospitals are able to foster and maintain a positive work environment they can potentially benefit from staff retention and positive outcomes for staff and patients.

Evidence indicated that nurses' practice environment is a critical factor related to

nurses' turnover behavior and intention (Jones, 1990a; Tai, Bame, & Robinson, 1998) . The meta-analysis of Irvine and Evans (1995) of data from 11 turnover studies in Western societies indicated there was a strong positive relationship between behavioral intention and turnover. Moreover, job satisfaction was strongly negatively correlated with behavioral intention and turnover. They found that of the variables related to nurse job satisfaction, work content and work environment variables has a stronger relationship with satisfaction than either economic or individual difference variables. Their findings underscore the importance of improving nurses' practice environment to prevent nurses' turnover. Similarly, Yin and Yan's meta-analysis (2002) also highlighted that effective retention strategies for Taiwanese nurses need to be targeted specifically to organizational factors and individual factors. Yin and Yan (2002) analyzing data from 13 turnover studies in Taiwan indicated that organizational factors, external environment factors and individually factor contribute to turnover among hospital nurses. Particularly, organizational factors are the key issue correlated with turnover. Organizational factors, pays, opportunities for promotion, job satisfaction, job stress, group cohesion and autonomy were found to be significantly correlated with staff turnover rates.

AACN (2002) noted that strategies for cost savings in health care including downsizing of the professional nursing workforce, restructuring of nursing service, changes in staff mix, shortening the length day of patients, and decreasing support services for patient care increased nurses' work stress and contributed to professional nursing's lack of fulfillment. Weinberg (2003) argued that the cost cutting and

restructuring of hospitals does cause severe negative impact on nursing professional performance. However, most administrators have ignored the potential dangers behind the application of restructuring and cost-containment polices in hospitals. Administrators tend to view nurses' complaints about the insufficient time spent with patients and its impact on outcomes as their unwilling to accept the change of health environment.

Aiken, Clarke, Sloane and Sochalski (2001) indicated that nursing shortage, high hospital-nurse job dissatisfaction, and reports of uneven quality of hospital care are international phenomena. As a result the increased deterioration in practice environments for nurses needs to be studied and resolved. According to these authors the preserving patient safety and the consistent delivery of the high quality nursing care should be addressed while managerial interventions are applied.

Since the accumulated evidence from Western studies thus far is sufficient to raise concerns about the importance of professional practice environment and its impact on nurse and patient outcomes, it's time to stand on the shoulder of the findings in Western countries to duplicate and expand knowledge in Taiwan. It is essential that organizations explore nurses' professional practice environment and link the practice environment to nurse and patient outcomes. The availability of data can increase our knowledge and inform policy and decision makers to develop effective projects with evidence base to improve both nurse and patient satisfaction.

Measurement of Professional Practice Environment in Nursing

Nurses practice in complex organizational context. Though organizational

context's influence on both nurses and patient outcomes has been well recognized, the empirical work in differentiating the various organizational concepts or their various effects is still limited (Estabrooks et al., 2002). Aiken and Patrician (2000) noted that instruments and methods for studying organizational attributes have lagged in nursing outcomes research. They claimed that in order to discover how organizational features affect both nurses and patients outcomes studies that engage in the measurement of organizational attributes in which nurses practice, is urgently needed. Estabrooks and her colleagues (2002) echoed the importance of the development of appropriate measurements to measure the organizational features. They noted that the development of the measure for assessing the organizational features could further facilitate the better understanding of which outcomes are sensitive to organizational features as well as the dose of an organizational features is required to affect an outcome. The authors believe that the knowledge could enrich the development of research to enhance professional practice environments.

The development of a reliable and valid measure of professional practice environment can facilitate the clinical applications in planning and monitoring change in work settings, evaluating the impact of intervention programs and improving the workplace. In this section, several measures used in nursing research are introduced and the methodological issues concerning the measuring the professional practice environment in nursing are discussed.

Measures of Professional Practice Environment in Nursing

There are many instruments that have been used to measure nurses' work environment within nursing research. These measures are now discussed.

The Nursing Work Index (NWI)

The Nursing Work Index (NWI) is a multidimensional measure consists of 65 items developed by Kramer and Hafner (1989) to measure four variables: job satisfaction (JS), work values related to job satisfaction (JSV), perceptions to quality nursing care (PP), and perceived productivity (PPV). The 65 items comprising the NWI were culled from findings associated with research on magnet hospital characteristics, job satisfaction and work value between 1962 and 1986 (Kramer & Hafner, 1989). Items in the NWI are placed on a 4-point Liker scale ranging from 1 (strongly disagree) to 4 (strongly agree) to elicit three responses: (a) how important the factor is for job satisfaction (JSV), (b) how important the factor is for producing quality nursing care (PPV), and (c) extent to which the factor is present in current job (Lake, 2002).

Scoring this tool is computed by adding the important scores to the presence score to obtain job satisfaction score and a quality nursing care score. The job satisfaction scores (JS) are computed by adding the scores from judging how important the factor is for job satisfaction (JSV) to scores from judging the extent to which the factor is present in current job; and the perceptions to quality nursing care scores (PP) are computed by adding the scores from judging how important the factor is for producing quality nursing care (PPV) to scores from judging the extent to which the factor is present in current job

(Kramer & Hafner, 1989). The content validity of the NWI was constructed by polling items through extensive literature review and using three of the four original magnet study researcher to validate the items. The psychometric properties of the NWI were tested with a regionally representative sample of 2,927 nurses from 16 of the original 41 U.S. magnet hospital and from eight nonmagnet U.S. hospitals. The criterion validity of the NWI were constructed by exploring the correlations between the job satisfaction scores (JS) and the past year's turnover rate; the correlations between the perceptions to quality nursing care scores (PP) and staff nurses' performance evaluations scores; and the correlations between the job satisfaction scores (JS) and the perceptions to quality nursing care scores (PP) . The Pearson correlation coefficient between the job satisfaction scores (JS) and the past year's turnover rate for 22 hospitals was -.95. The Pearson correlation coefficient indicated there was a positive correlation between the perceptions to quality nursing care scores (PP) and staff nurses' performance evaluations scores (r = .169). The Pearson correlation coefficient between the job satisfaction scores (JS) and the perceptions to quality nursing care scores (PP) ranged from .89 to .95. The internal reliability using Cronbach's alpha for each of the four scales were: JS, .894; JSV, .921; PP, .895, and PPV, .928 (Kramer & Hafner, 1989).

The Nursing Work Index-Revised (NWI-R)

Kramer and Hafner developed the NWI in 1984 with the intention to distinguishing differences in nurses' job satisfaction and productivity of quality of care in magnet and nonmagnet work environment rather than to quantify attributes of nurses'

professional practice environment (Kramer & Hafner, 1989; Kramer & Schmalenger, 2004). Aiken and Patrician (2000) claimed that the NWI was ideal for development to measure a hospital nursing practice environment because the NWI contains a comprehensive list of items derived from magnet hospital traits. Therefore, the authors modified NWI and created a 57-item NWI-Revised (NWI-R) scale, which was also named the clinical environment index, to measure the professional nursing practice environment (Aiken, Sloane, & Sochalski, 1998). Aiken and Patrician (2000) deleted the two value statements for responses in the NWI and retain the presence statement for responses to depict the traits of nurses' work environment. They reviewed the items in the NWI and deleted items perceived not significantly related to the elements of a professional practice environment. Finally, the NWI-R contained 57 items including 55 of the original NWI items, one item that was slightly modified a NWI item and one new item addressing team nursing added with the intention to comparison with primary nursing.

Three subscales in the 57-item NWI-R were conceptually derived to measure organizational attributes supportive of professional nursing practice: autonomy (five items), control over the work environment (seven), and relationships with physicians (three). Ten items chosen from the previous three subscales constructed the fourth subscale to measure organizational support for caregivers (Aiken & Patrician, 2000).

Though the NWI-R was first used in Aiken, Smith and Lake's study of Medicare mortality rates between magnet hospitals and nonmagnet hospitals in 1994, its

psychometric properties were not well discussed until in 2000. According to Aiken and Patrician's report (2000), the content validity of the 57-item NWI-R was supported by the fact that the development of the NWI-R was based on the use of the NWI that were validated by three of the original magnet hospital researchers in capturing elements items related to magnet hospital characteristics. The criterion-related validity of the NWI-R was demonstrated by its ability to differentiate nurses working within magnet hospitals from those working within nonmagnet hospitals, and its ability to identify differences in nurse burnout. Criterion-related validity for the NWI-R was evidenced by finding higher NWI-R subscale sores in certain organizations such as dedicated AIDS units and in magnet hospitals, which are associated with better outcomes such as higher patient satisfaction, decreased mortality, lower nurse emotional exhaustion and burnout, and lower incidence of needlestick injuries. The reliability assessment using Cronbach's alpha indicated that the overall Cronbach's alpha for the entire NWI-R was .96. For individual level data, the alpha was .75 for autonomy, .79 for control over practice setting, and .76 for nurse-physician relationships. However, for unit level data aggregating individual nurses' scores within units, the alpha was 85 for autonomy subscale, .91 for control over the work environment subscale, and .84 for relationships with physicians subscale, and .84 for organizational support for care givers subscale (Aiken & Patrician, 2000).

Practice Environment Scale of the Nursing Work Index (PES-NWI)

Though the NWI was comprised of the important organizational characteristics supportive of professional practice for nurses, with the goal to develop a parsimonious

psychometrically sound scale with empirically derived subscale, Lake (2002) using 1985-1986 data from Kramer and Hafner's study developed the Practice Environment Scale of the Nursing Work Index (PES-NWI). A group of three content experts including the researcher, a hospital staff and a nurse-researcher came to a group consensus on the definition of the nursing practice environment. Forty-eight items matching the definition of the nursing practice environment were selected from the original 65 NWI items for exploratory factor analysis. The principal axis factoring with varimax rotation identified five salient subscales underpinning a 31-item instrument, the PES-NWI. The five salient subscales were: nursing participation in hospital affairs (9 items); nursing foundations for quality of care (10 items); nurse-manager ability, leadership, and support of nurses (5 items); staffing and resources adequacy (4 items); and collegial nurse-physician relations (3 items). All factor loadings were over .40. The internal consistency reliabilities using Cronbach's alpha for the five subscales ranged from .71 to .84 for individual level and .64 to .91 for hospital level. The Cronbach's alpha for the entire instrument was .82 for individual level and .69 for hospital level. The construct validity of the PES-NWI was supported by its ability to differentiate nurses in magnet hospital from those in nonmagnet hospitals on their PES-NWI scores. Moreover, the confirmatory analyses using 11,636 Pennsylvanian nurses' data from Aiken's study (2001) supported the generalizability of the five-subscale structure in the PES-NWI.

Practice Environment Index (PEI)

Estabrooks and colleagues (2002) tested a 51-item NWI-R, which is similar to the

NWI-R reported by Aiken and Patrician (2000) with 17,965 Canadian registered nurses to validate its psychometric properties. The initial principal axis factoring with varimax rotation identified nine factors accounted for 54% of the variances with loading above .50. However, because the authors found that the derived nine factors could not well describe NWI-R conceptually, they using PCA with forcing a one–factor solution developed a 26-item instrument with loading above .50, which was termed as the Practice Environment Index (PEI). The Cronbach's alpha reliability on the 26-item PEI was .92. The alpha-if-item-deleted on the 26-item PEI ranged from .91 to .92. Though Estabrooks and colleagues (2002) claimed that the single-factor solution to the NWI-R, which is the 26-item PEI, is a unified measure to capture practice environment in Canadian context, they also argued that the further examination if the items of the NWI-R developed 20 years ago are still relevant in contemporary 21st century is needed to ensure if NWI-R was a robust measure.

Perceived Nursing Work Environment Scale (PNWE)

Currently, Choi, Bakken, Larson, Du, and Stone (2004) tested the 57-item NWI-R with 2,324 critical care nurses to evaluate its psychometric properties. The PCA with orthogonal rotation revealed seven factors accounted for 53.2% of the variances with loading above .40. The seven subscales extracted from the NWI-R included: professional practice (5 items); nursing management (5 items); staffing and resources adequacy (5 items); nursing process (6 items); nurses-physician collaboration (4 items); nursing competence (6 items); and positive scheduling climate (3 items). The internal consistency

reliability using Cronbach's alpha for the seven subscale ranged from .70 to .91, except for the positive scheduling climate subscale (Cronbach's alpha = .56). Choi and colleagues (2004) entitled this 42-item tool as the Perceived Nursing Work Environment (PNWE).

The Ward Organizational Features Scales (WOFS)

The Ward Organizational Features Scales (WOFS) were developed by Adams, Bond, and Arber (1995) to measure discrete dimensions of acute hospital wards in the U.K. The WOFS includes six sets of measures comprising 14 subscales presented as four-point Likert Scale. The WOFS was established based on qualitative study using semi-structured interviews with nurses working in acute hospital's to elicit nurses' views about influenced on care provision. The 105 items recruited in the WOFS were conceptually constructed and empirically tested using factor analytic techniques. Factor analysis with oblique rotation recognized six extracted factors: phychical environment of the ward (20 items); professional nursing practice (19 items); ward leadership (9 items); professional work relationships (26 items); nurses' influences over (24 items); and job satisfaction (7 items). These six factors accounted 39.5 % of the variances. Factor analysis of the six different sets of items produced two or more subscales in most factors except the job satisfaction and the ward leadership scales, in which only one single factor emerged. The phychical environment of the ward scale included four subscale: ward facilities (5 items); staff organization (5 items); ward layout (6 items); and quality of ward services (4 items). The professional nursing practice scale included 2 subscales: professional practice

(13 items) and hierarchical practice (6 items). The professional work relationships scale included 3 subscales: collaboration with Medical Staff (9 items); collaboration with other health care professionals (7 items); and cohesion amongst nurses (10 items). The nurses' influences over included 3 subscale: ward management (10 items); timing of ward and patient events (9 items); and financial and human resources (5 items). The internal consistency reliability using Cronbach's alpha for the subscales of the six scales of WOFS ranged from .66 to .91 and the test-retest Pearson correlation coefficient for the subscales of the six scales of WOFS ranged from .70 to .90.

The Work Environment Scale (WES)

The Work Environment Scale (WES) is one of social climate scales, which wads developed by Moos to measure the actual, preferred, and expected social environments of work settings. The WES consists of ten subscales to measure three underlying sets of dimensions, namely, relationship dimensions, personal growth (or goal orientation) dimensions, and system maintenance and change dimensions. There are 90 items underpinning the WES to measure the 10 specific subscales: involvement, coworker cohesion, supervisor support, autonomy, task orientation, work pressure, clarity, managerial control, innovation, and physical comfort. The WES comprises three forms: the real form (or Form R), the ideal form (or Form I), and the expectations form (or Form E). Form R is used to measure managers' and employees' perceptions of their current work environment. Form I measures managers' and employees' conceptions of an ideal work environment. And Form E measures prospective managers' and employees'

expectations about work settings. Form R is most used in healthcare settings (a) to evaluate climates in workplaces encountering or needing change; (b) to understand individuals' perceptions of their workplaces; (c) to formulate clinical case descriptions and understand the workplace's importance; (d) to monitor the impact of changes to the workplace; (e) to promote improvement in workplace; (f) to describe and compare work settings; (g) to examine the determinants of work climates; and (h) to focus on the associations between perceived work climates and outcomes for groups and individuals. The test-retest reliability with 1-month interval of the WES ranges from 0.69 for clarity to 0.83 for involvement subscale. The internal consistencies using Cronbach's Alpha of the 10 subscales range from .69 to .86 in a sample of 1,045 nurses (Moos, 1994).

The Essential of Magnetism (EOM)

The Essential of Magnetism (EOM) scale was developed by Kramer and Schmalenberg (2004) to measure aspects of magnetic work environment that staff nurses consider essential for productivity of quality of care. The EOM comprises 57 items generated from participant observation and interview with 289 magnet hospital staff nurses. The principal component analysis (PCA) with varimax rotation and Kaiser normalization revealed that the 57-item EOM comprise eight subscales: good nurse-physician (RN-MD) relationships (five items), autonomy (seven items), controlling of or over nursing practice (ten items), support for education (three items), clinical competence (five items), cultural values (twelve items), nurse manager support (ten items), and adequacy of staffing (five items).The content validity of the EOM ranged

from .88 to 1. The criterion-related validity was evidenced by its ability to differentiate nurses working within magnet hospitals from those working within nonmagnet hospitals. The stability reliability with 2-to 3-week interval with a convenience sample of 42 nurses ranged from .53 for clinical competence to .88 for control over practice. The internal consistencies using Cronbach's Alpha of the 8 subscales range from .69 for competence to .94 for cultural value and control over practice subscales.

The Professional Practice Environment Scale (PPE)

The Professional Practice Environment (PPE) Scale was developed by Ives-Erickson and colleagues in late 1998 based on a Professional Practice Model designed by Ives-Erickson to provide a framework that could guide professional practice across disciplines. The PPE Scale measures eight characteristics of the professional practice environment of staff working in acute care settings. Items in the PPE Scale were conceptually developed based on eight well defined critical domains of the professional practice environment. The 38 items of the PPE Scale were constructed to be relevant in current practice work environments for health professionals under the foundation of magnet hospital concept. The PPE scale has been empirically tested and revised in Massachusetts General Hospital (MGH) over five years. The principal component analysis (PCA) with varimax rotation and Kaiser normalization revealed the presence of eight parsimonious and interpretable solutions within the 38-item PPE Scale. The eight factors underpinning the PPE Scale include: handling disagreement and conflict (eight items), control over practice (seven items), internal work motivation (seven items),

leadership and autonomy in clinical practice (five items), teamwork (four items), cultural sensitivity (three items), communication about patients (two items), and staff relationships with physician (two items). The Cronbach's alpha internal consistency reliability was .93 for the overall scale and ranged from .78 to .88 for the eight extracted factors in the 38-item PPE Scale (Ives-Erickson, et al., 2004).

Issues Concerning Measuring the Professional Practice Environment in Nursing

As mentioned above, there are different measures used in nursing research to measure nurses' work environments. Most of the instruments measuring organizational attributes in the U.S such as the NWI-R, PES-NWI, PEI, PNWE are derived from Nursing Work Index (NWI). Specifically, the NWI-R has been widely used by the research team in the University of Pennsylvania to measure organizational attributes for the research program of examining the relationships between organizational factors and both patient and nurse outcomes. Over the past decade, NWI-R has been used extensively by Aiken and colleagues as a measure of the characteristics of the hospital working environment perceived by nurses in their ongoing national and international investigations within a research program examining relationships between organizational attributes and both patient and nurse outcomes (Aiken. Clarke, & Sloane, 2000; Aiken. Clarke, & Sloane, 2002; Aiken, Clarke, Sloane, Sochalski, Busse, et al., 2001; Aiken, Havens, & Sloane, 2000; Aiken, Lake, Sochalski, & Sloane, 1997; Aiken, & Sloane, 1997a; Aiken, & Sloan, 1997b; Aiken, Sloane, & Sochalski, 1998; Clarke, Sloane, & Aiken, 2002; Vahey, Aiken, Sloane, Clarke, & Vargas, 2004).

From the literature review detailing the history of the NWI, the data suggests that the NWI was initially developed based on need fulfillment theory to distinguish differences in staff nurse job satisfaction and productivity of quality of care in magnet and nonmagnet work environment (Kramer, & Schmalenberg, 2004). The NWI was not originally designed to characterize the attributes of staff nurses' work environments. Staff nurses' perceptions and values associated with job satisfaction and productivity of quality of care are the focuses on the NWI. Though Aiken and Patricain (2002) revised the NWI as a measure to assess organizational traits with the argument that items on the NWI are derived from Magnet hospital study, there are evidences indicating problems on the NWI and its revisions or derivations.

The first problem associated with NWI and NWI-R is the outdatedness of the items. After years of administrating the NWI, many of the 65 items on the NWI are perceived by many magnet hospital staff nurses to be unimportant for either job satisfaction or providing quality care (Kramer, & Schmalenberg, 2002). They questioned that the NWI is now outdated (Kramer, & Schmalenberg, 2004). They illustrated that some unimportant items on the NWI such as ″use of written nursing care plans″and ″use of nursing diagnosis″were still kept in the NWI-R. Lake (2002) using the 1985-1986 NWI nurse data for factor analysis found that the items in the nurse autonomy subscale recognized by Aiken and Patrician (2002) did not empirically cluster in the five extracted subscales. Kramer and Schmalenberg (2004) pointed out that the NWI-R does not solve the NWI's problems of outdatedness.

The second problem within the NWI and NWI-R is the confused and inconsistent validity of the tool (Kramer & Schmalenberg, 2004). According to Aiken and Patrician's psychometric report about the NWI-R (2000), some items do not load in the expected domain which fits the concept of the items. For example, an item, ″nursing controls its own practice″loads on the autonomy subscale instead of the control over the practice setting subscale (Aiken, & Patrician, 2000). Items such as ″each nursing unit determines its own policies and procedures″and ″staff nurses actively participate in developing their work schedules″reflecting the concept of control over nursing practice are not included in the control over the practice setting subscale (Aiken, & Patrician, 2000). Moreover, the staff adequacy subscale reported by Vahey, Aiken and colleagues (2004) included four of the original items of the control over the practice setting subscale (Aiken & Patrician, 2000). The 5 items for the administrative support subscale (Vahey et al., 2004) included two of original items of the autonomy subscale and one original item of over the practice setting subscale. According to Aiken and Patrician (2000) there are 57 items recruited in the NWI-R, however, only 15 items have been clearly described to measure three subscales: autonomy, control over the practice, and nurse-physician relationships. What is measured by the remaining 42 items were not described in its psychometric evaluation report. Moreover, Kramer and Schmalenberg (2004) questioned that the additional items added by Aiken and Patrician (2002) to measure nursing delivery system on the NWI-R are not relevant to a magnetic work setting.

The third problem is the confusion and inconsistency with regard to the number of

items for the subscales or total scale on the NWI-R is also found. For example, the total items recruited in the PPE Scale have been changed from 57 (Aiken, Lake, Sochalski, & Sloane, 1997; Aiken, Sloane, & Sochalski, 1998; Aiken & Patrician, 2000; Aiken & Sloane, 1997b) to 49 (Aiken, Clarke, & Sloane, 2002; Aiken, Havens, & Sloane, 2000; Clarke, Sloane, & Aiken, 2002) without any clear explanation about the reason for reducing the number of items in the NWI-R. The number of items recruited in the organizational support subscale ranged from 10 (Aiken & Patrician, 2000) to 9 (Aiken, Clarke, & Sloane, 2000).

The forth problem is the confusion and inconsistency with regard to the terminology used to describe the subscales underpinning the NWI-R. It is noted that the terminology used to characterize the different concepts and measures of organizational attributes comprising the NWI-R are different across various research projects. Even multiple studies conducted by Aiken and colleagues, there are still confusion and logical inconsistency with regard to the terminology. For example, Aiken (2002) indicated that the subscales in the NWI-R are conceptually and empirically created to measure core attributes of an environment supportive of professional nurse practice: autonomy, control over the practice setting, relations between nurses and physicians and organizational support. The subscales in the NWI-R have been subsequently refined to measure resource or staffing adequacy and administrative support (Aiken, 2002). Clarke and colleagues (2002) described that there were 6 empirically derived subscales in the NWI-R produced through factor analytic techniques. The basic set of six substantive factors emerged from

the NWI-R using data from an AIDS study carried during 1990-1991 included: (a) regarding for nursing throughout the hospital, (b) staffing and support services resource adequacy, (c) collaboration between nurse and physicians, (d) nurse manager ability, leadership, and support of nurses as professionals, and (f) nurse professional development and advancement (Estabrooks et al., 2002). In general, the terminology used to describe the subscales in the NWI-R within the literatures included nurse autonomy, nurse control over the practice setting, relations between nurses and physicians (Aiken & Patrician, 2000; Aiken, Sloane, & Sochalski, 1998), resource adequacy, support for professional nursing practice provided by nurses managers, nurse manager leadership, status for nursing in the hospital or organization (Aiken, Clarke, & Sloane, 2000; Clarke, Sloane, & Aiken, 2002; Vahey et al., 2004), and organizational support for nursing care (Aiken, Clarke, & Sloane, 2002). The factor structures extracted form the NWI-R and the items loaded in the extracted factors vary across studies. These variations raise the concern about the validity issue when the NWI and its revisions or derivations are clinically applied for measuring practice environment. In sum, the use of the NWI and its revisions or derivations as a measure to measure professional practice environment may raise the issue of validity.

The EOM has recently been developed as a valid and reliable measure of the aspects of a magnetic work environment that staff nurses consider critical for productivity of quality of care (Kramer & Schmalenberg, 2004). The EOM is totally grounded in the concept of magnetism. Thus, items on the EOM derived from the magnetic essentials

identified by magnet hospital staff nurses may have limited capacity to detect or describe non magnetic settings validly.

Though the WES has been used to measure nurses' work settings, it was originally developed to measure the organizational climate rather the professional practice environment for nurses. Estabrooks and colleagues (2002) indicated that the concept of practice environment is conceptually distinct from the concepts of organizational culture and climate. Therefore, the use of the WES as a measure to measure professional practice environment may raise the issue of appropriateness.

The 105-item WOFS developed in the U. K. captures many contextual features that are perceived by nurses as having major impact on how they organize their work and its effectiveness but not the concept of the professional practice environment. Moreover, the 105 items on the WOFS are a burden for participants. Hence, the use of the WOFS to measure professional practice environment is limited.

The development of the PPE Scale was guided by the professional practice model (PPM) (Ives Erickson, et al., 2004). The PPM was proposed by the nursing leader at MGH as a comprehensive strategic plan to allow nursing to articulate her contributions and to have opportunity to bring individual perspectives to the table. The PPM was developed as a strategy to facilitate the interdependent relationships between staff nurses and other health professionals within the context of their own practice (Ives Erickson, Hamilton, Jones, & Ditomassi, 2004). The core elements of the PPM derived from findings of magnet hospital studies and organization reconstructuring guided the tool

developers to conduct updated and critical construct into the PPE Scale (Ives Erickson, Duffy, et al., 2004). The sound basis of the PPE Scale is reflected in the factorial structure derived from factor analysis fits its theory base and in its good psychometric properties.

In order to facilitate the knowledge development of nursing science, linking theory, research and practice should be aware by nursing scholars. According to Dickoff, James and Wiedenbach (1968), ″nursing theory, nursing practice, and nursing research are mutually interrelated and interdependent″ (p.415). Dickoff and James (1970) noted that practice theory is ″thought intended for action″; research is ″action for thought″, and professional practice is ″action guided by thought″ (p. 417). Nursing theory is born in practice, is refined in research and must and can return to practice for further theory or research development (Dickoff, et al., 1968). Dickoff, and colleagues (1968) identified four levels of theory, namely: (a) factor-isolating, (b) factor-relating, (c) situation-relating, and (d) situating-producing. They indicated that each of the four levels of theory presupposed and built on the other level. Among the four levels of theory, the situation-producing theory is the highest level of theory. According to Dickoff, and colleagues (1968), nursing as a practice discipline required situation producing theory most. Situation-producing theory was the most powerful in terms of being able to prescribe nursing activity. It moved beyond description, explanation, and prediction to control (Jackson, & Gillis, 2002).

From the review of the measures developed to evaluate the professional practice

environment, it is clear that the professional practice environment contains multidimensional constructs. Overall, the author believes that the major limitation of measuring nurses' professional practice environment stems from the absence of a clear conceptualization of the professional practice environment to guide the measurement of the complex contexts of the environment in which nurses practice their profession. Among the available measures mentioned above, the PPE Scale is the only measure that was conducted using theoretical framework informed by nursing knowledge. Each of the constructs on the PPE Scale has been well conceptualized by the tool developers. Moreover, the PPE Scale includes updated constructs such as delivery of culturally sensitive, competent care; and resolving conflicts, which are critical in contemporary work environment. In general, the PPE Scale developed based on a situation-producing theory, the PPM, helps nursing and other disciplines move beyond description to explanation, prediction and in so doing control, improve and change the professional practice environment.

Translating and Adapting Measurement Instruments for Cross-Cultural Research

The exchange of international research projects in nursing has increased during recent years. Translating a research instrument from one language to another is required for cross-cultural research involving different cultural groups. However, the barriers of culture and language are major challenges for cross-cultural investigations (White & Elander, 1992). Cross-cultural study can only be meaningful when designed with reliable and valid instruments (Carlson, 2000). To develop comparable measures through rigorous

steps can allow legitimate comparison across cultural and ethnic boundaries (Tran, & Aroian, 2000). While translating a research instrument from one language to another, concerns with issues of cultural sensitivity and maintaining the meaning and intent of the translated instrument must be seriously attended to. Failure to apply rigorous translation methodology can lead to major threats of validity and reliability. Inaccuracy and inadequacy of the translation can result in a totally different instrument which measures concepts that are not intended by the originating developers (White & Elander, 1992). Hence, in order to obtain meaningful findings gathered by a translated measure, cross-cultural researchers need to use a rigorous translation methodology to reach the equivalence between a translated measure and its original version.

Translation Theory and Methodology

When conducting a cross-cultural study, translating a measure from a source language into a target language is crucial (Werner & Campbell, 1970). Source language is the original language of the measure, while target language is the language into which the translation is made (McDermott & Palchanes, 1994). Research goals guide the translation strategy and interpretation of research findings on cross-cultural research (Jones & Kay, 1972). The goals on cross-cultural research can be dichotomized as operational and comparative (Irvine & Caroll, 1980). The goal of operational research is to determine the cultural distance between groups or the degree of acculturation, while the goal of comparative is to reference a construct across cultures (Irvine & Caroll, 1980). Werner and Campell (1970) defined two categories of translation including unicentered (or

asymmetrical) and decentered (or symmetrica) translation.

The unicentered translation addresses the loyalty to one language, usually the source language. In contrast, the decentered translation focused on both loyalty of mening and equal familiarity and colloquialness in each language. When using an unicentered translation strategy, the target language may seem unnatural and exotic (McDermott & Palchances, 1994). The decentered translation is viewed as a better way of developing culturally appropriate instruments because decentering eliminates the distinction between source and target language and focuses on equivalence. In other words, the decentered translation allows the researcher to adjust the source language version to account for the characteristics or limitations of the target language(Werner & Campbell, 1970).

Though the decentered translation could extend the length of the translation process because multiple translation iterations may be necessary, it helps to guarantee production of fully equivalent linguistic versions (Marin & Marin, 1991). According to Jones (1986), the unicentered translation is used in a cross-cultural study with an operational goal, while the decentered translation is used in that with a comparative goal. The mismatch between the research goal of a cross-cultural study and the translation strategy used to develop a translation measure can compromise the validity of cross-cultural findings (Jones & Kay, 1972).

Translation Techniques

Translation techniques have been discussed extensively and several types have been described in the literature (Behling & Law, 2000; Brislin, 1970; Carson, 2000;

Maneesriwongul & Dixon, 2004; Marine & Marine, 1991; Werner & Campbell, 1970). In description of translation techniques, the approaches with a focus on translation without any test are described below.

One-Way Translation

One-way translation (also called forward translation, or direct transaltion) refers to asking a bilingual individual to translate a measure from the source language into target language. This method is simple and inexpensive but leads to lower validity and reliability of the translated measure (Behling & Law, 2000; Carson., 2000; Maneesriwongul & Dixon, 2004; Marine & Marine, 1991;).

The Modified Direct Translation

The modified direct translation refers to using discussions among a panel of experts and between panel experts and the translator to produce a target language translation. In the modified direct translation, a panel of experts is asked to review the draft target language instrument, share their comments and meet together to come to a group consensus on their opinions about translation. The original translator meets with the panel experts to explain the reasons for drafting the instrument in the manner used and the panel experts explain why they reacted to the draft as they did. Through the interaction of the translator and the panel experts, a target language translation can be produced with representative consensus (Behling & Law, 2000).

Back Translation

Back translation (also called double translation) refers to using two independent

translators working independently. The first translator translates a measure from the source language into target language. The second translator translates the target-language version into source language. The researcher can consult with both translators for reconciliation of discrepancies. This method has been considered the optimal method of translating a measure into another language though it is expensive and time-consuming and has some limitations The quality of translation using back translation method will be threaten when translators try to interfere with the original version, share common world views from their similar backgrounds and keep the grammatical forms of the source-language version. However, the provision of specific instruction to the translators regarding inference, wording, and phrasing or emphasizing adaptation over translation can minimize the limitations of the back translation method (Brislin, 1970, 1986; Carson., 2000).

Translation/Back Translation

The translation/back translation refers to an iterative process in which a cycle of four steps repeated until the two source language versions are identified or contain only minor difference (Behling & Law, 2000). The four steps were:

(1) A bilingual individual translated the source language measure into the target language.

(2) A second bilingual individual with no knowledge of the wording of the original source language document, translates the draft target language back into the source language.

(3) The original and back-translated source language versions are compared.

(4) If substantial difference exists between the two source language measures, another target language draft is prepared containing modifications designed to eliminate the discrepancies. (p. 19-21)

Back-Translation with Decentering

The Back-translation with decentering (Brislin, 1986) is similar to the translation/back translation method described by Behling and Law 2000. Brislin (1986) suggested that the procedure back translation can be repeatedly for several rounds, as different bilinguals work with the efforts of their predecessors. Through the several rounds of back translations, both of the source and the target language versions move back and forth. No one language is the center of attention during the rounds of back translation. The decentered translation procedures can eliminate the distincinction between source and target language versions and stress equivalences (Brislin, 1986). Back-translation with decentering can solve problems in the wording of the measure and produce a more comprehensible measure (Marine & Marine, 1991).

Supportive Techniques

Among the translation techniques described, back translation is highly recommended by experts on cross-cultural research (Brislin, 1970; Werner & Campbell, 1970). In addition to the described translation techniques, the use of additional strategies has been described in literature (Brislin, 1986; Behling & Law, 2000; Maneesriwongul and Dixon, 2004; Marine and Marine, 1991). For example, Brislin (1980) suggested that

researchers combine additional techniques such as the committee approach, bilingual technique, and pretest method for the special needs of their research project in addition to back translation. Brislin (1986) also suggested that during the several rounds of back-translation, researchers can use monolinguals to identify any phrases unfamiliar to the study participants in the target language version and then rewrite it before another bilingual translates it into source language.

To ensure a culturally equivalent translation, it has been suggested that researchers develop several translation probes such as field pretest, use of bilinguals, and evaluation by experts (Carson, 2000; Marine & Marine, 1991). The goal of translation probes is to test the accuracy of the translation by comparing the similarity between the target language version and the original language version. Translation probes allow researchers to better estimate the accuracy and appropriateness of a given translation (Marine & Marine, 1991). In general, these additional methods are associated with the number of translators or the equivalence of the translation. These additional methods are described in the following pages.

The Committee Approach

The committee approach is the use of a group of bilinguals to translate form the source to the target language. The advantage of using the committee approach is that the mistake of one member can be detected by others on the committee. However, the disadvantage of this method is that committee members may compromise each other because they are not willing to criticize one another or may unify against the researcher

(Brislin, 1980). Translation by committee requires two or more bilinguals to translate a measure from the source language into target language. Translation by committee method allows bilingual translators to work either separately or together to have independent translations to be selected as the most appropriate version or to produce a consensus version.

The parallel blind technique proposed by Behling and Law (2000) is a kind of the committee approach. The parallel blind technique also requires that two translators independently translate the source language version into the target language in parallel rather than in sequence. They then meet to compare their versions and to resolve any differences and come to a consensus on a final draft target language version. In general, Translation by committee is less time-consuming as compared to back translation but also is limited due to the fact that the translators have common cultural world views from their similar backgrounds or they have to agree with the translations under the pressure to forming a consensus (Brislin, 1980; Carson., 2000; Marine & Marine, 1991).

The Bilingual Technique

The bilingual technique refers to asking bilingual individuals to answer both of the original and the target language versions of the instrument and compare the similarity in responses (Marine & Marine, 1991) The assumption underpinning this method is that bilinguals produce similar responses to two linguistic versions of a measure (Marine & Marine, 1991). To ask bilinguals to take the same test or different groups of bilingual take different halves of a measure composed of two languages can help identify items yielding

discrepant responses, or differing frequency of responses (Brislin, 1980). The advantage of the bilingual technique comes from its preciseness and the potential of using sophisticated statistics to test the measure. However, the disadvantage of the bilingual technique is that the research measure is developed on bilinguals' responses not typical group, monolingual group (Brislin, 1980). Marine and Marine (1991) also noted this method has limitations, because differences in response may not come from translation problems but from culture-specific values manifested through each language or from the social desirability of the items as perceived by bilinguals working in a specific language.

The Monolinguals Technique

The monolinguals technique is the use of monolinguals to review and rewrite the target language version before another bilingual translates it into original language to prevent the bias that researchers may use phrases which are unfamiliar to the study participants (Brislin, 1986).

Evaluation by Experts

The evaluation by experts refers to having experts to evaluate the clarity and linguistic appropriateness of the translation (Carlson, 2000; Marine & Marine, 1991). While using this method, the selection of experts should be cared to ensure the quality of evaluation.

The Ultimate Test

The ultimate test refers to using four groups of bilinguals to test for semantic equivalence between the source and the target language versions. The first group

members respond to the source language version. The second group members respond to the target language version. The third group members respond to a measure in which the first half of the items is in the source language and the second half in the target language. The fourth group members respond to a measure in which the first half of the items is in the target language and the second half in the source language. The equivalence between the source and target language versions is estimated by comparing the means total scores and item frequency distributions among the four groups of respondents and computing the correlations between scores on the ″source language″ and ″target language″ halves of the questionnaire given to the third and fourth group (Behling & Law, 2000).

The Random Probe Techniques

Behling and Law (2000) proposed random probe technique occurs when the draft target language instrument is tested with a group of target language speakers who are asked to explain why they responded as they did to individual items (Behling & Law, 2000).

The Pretest Method

The pretest procedures occurs when a completed translation is field tested to insure that target people will understand the measures to which they will be expected to respond (Brislin, 1980). Marine and Marine (1991) proposed a pretest method called the field pretest. The field pretest refers to the administration of the translated measure with a group of individuals resembling the target population and then using an open-ended question such as ″What do you think this question asks?″to ask the participants to express

their understanding of the items (Marine & Marine, 1991). Because participants can still produce responses even though they do not understand the meaning of the item, the use of field testing is particularly important to a measure designed with Liker scale or dichotomous scale for participants' responses to detect the accuracy of the translation (Marine & Marine, 1991).

Recently, Maneesriwongul and Dixon (2004) analyzing the elements of the instrument translation process of 47 articles described six categories of instrument translation in to a hierarchy: (a) forward-only, (b) forward translation with testing, (c) back-translation, (d) back-translation and monolingual test, (e) back-translation and bilingual test, and (f) back-translation and monolingual and bilingual test. The forward-only translation refers to simply translating a measure from the source language into the target language. The forward translation with testing refers to translating a measure from the source language into the target language plus a pretest of the target language version. The back-translation occurs when a measure is translated from the source language into the target language by a translator and then the target language version is translated back into the source language by other translators. The back-translation and monolingual test describes the use of back-translation plus test of the target language version among monolingual subjects who are the target language speakers. The back-translation and bilingual test refers to the use of the back-translation plus test of the source and target language versions among bilingual subjects. The back-translation and monolingual and bilingual test refers to the use of back-translation

plus test of the target language version among monolingual subjects who are the target language speakers and test of the source and target language versions among bilingual subjects. According to Maneesriwongul and Dixon (2004) the method of back-translation and monolingual and bilingual tests is the best of the six methods for instrument translation.

In general, the terms and boundaries used to describe the translation techniques in the literatures tend to be blurred due to the complexity of methods utilized in the translation process. Maneesriwongul and Dixon (2004) noted that several translation techniques have been recommended, but none is perfect. They suggested that if factors such as the number of available translators, budget, time or the number of available bilingual subjects are limited, back translation and test among target language subjects should be required at the very least. In sum, multiple methods exist for researchers on cross-cultural research to pursue the best of translation.

Translation Procedures

Carlson (2000) pointed out that designing and documenting scientifically sound translation procedures and equivalency testing are critical in the development of a translated instrument. To produce an adequate translation, Brislin (1970) recommended the following procedures:

(a) Write an English version that can be easily translated using simple sentence and add redundancy to sentences and contexts to difficult ideas.

(b) Obtain competent translators familiar with the contents involved in the source

language materials.

(c) Instruct one bilingual to translated a measure from the source to the target language, and another to blindly translate back from the target to the source language.

(d) Have several raters examine the source, target, and/or the back-translated versions for meaning errors. If errors are found, repeat step three making revisions in the source version if necessary.

(e) When meaning errors are nil, pretest the target version with a group of target language-speaking people and revise the translation and /or the original version.

(f) Having three groups of bilinguals to separately complete the source version, the translation and both versions and assess the similarity between groups to identify equivalence.

Banville, Desrosiders, and Genet-Volet (2000) proposed seven steps to insure appropriate cross-cultural translation and validation: (a) preparation of preliminary versions, (b) evaluation of preliminary versions and preparation of an experimental version, (c) pretest of the experimental version, (d) evaluation of the concurrent and content validity, (e) evaluation of the reliability, (f) evaluation of the construct validity, and (g) establishing norms. The first three steps of this particular translation procedure focus on the translation process and pre-examination. The remaining steps focus on using various tests to demonstrate the psychometric properties of the instrument. Banville and colleagues' study (2000), grouped four bilingual translators into two groups to separately

translate a study instrument to avoid the bias by having only one person in the step of preparation for the preliminary versions. Two translators were given instructions addressing the meaning of the statement rather than literal translation is the instrument's focus. Then the two translators independently translated the original version into the desired language in parallel. Finally, the two versions were collaboratively compared and revised for differences between the two translators in order to obtain a consensus on the best translation which contains appropriate meaning, vocabulary, grammar, and/or syntax. The target version then was given to two new translators for being back translated into source language.

In the second step, a committee, composed of translators, monolingual and bilingual was set up to compare the similarities of the back-translated version as relative to the original version to prevent possible bias by a single researcher and to obtain committee members' consensus on a final experimental version. In the third step, focusing on pretest the experimental version, a representative sample of people were asked to answer to experimental version of the translation and identify any incomprehensive words or expression. Modification was made after the committee examined the comments on the problematic items to obtain a quality experimental version. For step 3 to 6, a group of bilingual participants composed of 20 to 30 participants was asked to pilot the instrument to estimate the psychometric properties of the instrument: content, concurrent and constructive validity and reliability including test-retest reliability and internal consistency. After the instrument was judged valid,

reliable, and meaningful in the new culture, a large number of participants were asked to test the instrument to establish norms in the last step.

Butcher (1996) suggested a 7-steps translation procedure to develop a translation equivalent to the original. These seven steps were:

(a) The translation: asking at least two translators to independently translate the measure from source to the target language and using discussion among translators to obtain the best translation.

(b) Back translation: asking an independent bilingual translator to translate the target language versions back into source language.

(c) Comparison of the source and back-translated versions: comparing the items of the back-transalted version with items of the original source language version and identifying items with different meaning for being retranslated and again back-translated until equivalent meanings are obtained.

(d) Study of equivalence: administering both of the original source language and the target language versions to a selected group of bilinguals for a test-retest to compare similarity or difference for the evaluation of equivalence.

(e) Development of culturally appropriate norms: administering the translation to a sample of target participants to evaluate whether the test works in the new culture as it does in the original.

(f) Development of norms for the target country: administering the translation to a large group of target participants.

(g) Study to determine the utility of the translated instrument in clinical settings: researching the translated version in clinical settings to determine if the instrument is operating in the target language country as they do in the source language country.

In addition to performing translation techniques and validating the translation, Brislin (1986) recommended documenting the detailed information concerning translation. The information about translation procedures with existing measures can help the development of a new translation. Brislin (1986) recommended the bellow indications regarding the translation efforts should be recorded:

(a) Items those were difficult to translate.

(b) Item that were modified to obtain cultural in contrast to linguistic equivalents and the reason of modification.

(c) Items that were translated literally and the reason of translation.

(d) Items on the original version that needed grammatical modification.

(e) Items containing idioms in the original language version were rendered into standard, nonidiomatic phrase in the target language.

(f) Items that were changed form negative to positive wording, or vice-versa.

(g) Items that were easily translated without modification, but about which researchers have doubts.

Issues Regarding To Translators

The qualifications of the translators determine the success of a translation (Marin

& Marin, 1991; Maneesriwongul & Dixon, 2004). Knowledge and experience are the two key characteristics of a qualified translator (Marin & Marin, 1991). A translator should have an intimate knowledge of the language, the interested cultures and be familiar with both the concept and the clinical application of the translated instrument (Geisinger, 1994). However, if there is a difficulty of fining translators who meet all of Geisinger's criteria, fluency in language and cultural awareness rather than knowledge of the instrument and its potential use should be the first priorities for recruiting translators (Behling & Law, 2000). Marin and Marin (1991) indicated that the coordinate bilinguals who learned the languages at different time and, preferably, in two different cultures have a better ability to articulate the cultural meaning of the words than compound bilinguals who learned the language at the same time. Teaching competent translators about the instrument to increase their knowledge of the instrument and its use can also facilitate the success of translation (Behling & Law, 2000). The use of sufficiently educated translators to ensure understanding of the concepts in both languages can also help to facilitate the accuracy of translation (Chang, Chau, & Holroyd, 1999). In order to qualify translators, Guillemin and colleagues (1993) suggested that translators should preferably translate into their mother language, be aware of the objects underlying the martial to be translated and the concepts involved so as to offer a more reliable restitution of the intended measurement, and be unaware of the subjects and concepts to elicit unexpected meanings from the original tool.

Marin and Marin (1991) suggested the implementation of the following

approaches regarding to translators to avoid some problems inherent in translation: (a) recruiting bilingual and bicultural translators so that the cultural-specific nuances of the terms used in both of the source and target languages; (b) instructing translators not try to infer the original version but instead to consider the target version as the original version during the process of back-translation; (c) encouraging translators to point out words that could be translated in several ways to clarify connotative meanings; and (d) asking translators to identify any terms or sentences that appeared difficult to explain in the target language when translating back to source language.

Adaptation of Instruments

Adaptation refers to the process of developing measures across languages (Geisinger, 1994). Cross-cultural adaptation contains two components: the translation of a measure and its adaptation (Guillemin, Bombardier, Beaton, 1993). When using a translation instrument originally developed from a different culture, it is important to check the validity and usefulness of the instrument. A translated measure may need to be adapted before it is used in the cultural different from the one in which it was developed (Geisinger, 1994). Adaptation is oriented towards measuring a similar phenomenon in different cultures. The cross-cultural adaptation of a measure is a prerequisite for the investigation of cross-cultural difference. Cross-cultural comparison identifying differences attributable to culture can not be accomplished without the use of a culturally adapted measure (Guillemin, et al., 1993).

Modifications of existing instruments have to be made to obtain good translations,

and thus good terms for data collection (Brislin, 1986). The similarities in language structure and in culture determine the degree of adapting an instrument (Guillemin, et al., 1993). Brislin (1986) indicated that researchers using existing instruments run the risk of missing aspects of a phenomenon important to other cultures and imposing conclusions without cultural sensitivity. Brislin recommended that researchers using existing tests on cross-cultural research should be willing to modify and add new items to the instrument which tap into other aspects of a phenomenon in addition to those indicated by the original test. Butcher (1996) also pointed that items found to be inappropriate or nonequivalent culturally can be a critical challenge on cross-cultural research. Modifying content in an effort to preserve the psychological meaning of the items in the new language or completely replacing the inappropriate items by new ones retaining the psychological connotation of the original items but are cultural appropriate, may be needed during translating a measure into another language and culture. The adaptation and modification of valid measures developed in other countries for other cultures can increase the availability of linguistically and cross-culturally valid measures (Dela Cruz, et al., 2000).

Establishment of Cultural Equivalence

Establishing equivalence of measures is important to ensure the validity of translated tools and thus results when translating an existing instrument. Studies that simply apply translated tools without any apparent attention to determining equivalence with the original tool will be limited by themselves in terms of the concern about the

equivalence in cross-cultural adaptation of measures (Chang, Chau, & Holroyd, 1999). Keeping the item content in the target version as parallel to the original version as possible is an important requirement because the primary goal in the translation is to capture the same scale meanings in the target language and culture (Butcher, 1996). To demonstrate not only psychometric properties but also the semantic, conceptual and normative equivalence relative to the source language measure of a translated instrument is important for cross-cultural research (Behling, & Law, 2000). While establishing translation equivalence is en expensive and labor-intensive task, data obtained with instruments without being tested for equivalence may be meaningless (Carlson, 2000). Without evidence of equivalence at several levels, cross-cultural data can not be reliably interpreted (Butcher & Han, 1996). Designing and documenting equivalency testing are required in the development of a translated instrument (Carlson, 2000).

Equivalence is ″a from of validity that refers to the agreement between two measures of the same construct″ (Chang, Chau, & Holroyd, 1999, P. 317). Several types of equivalences have been described in the literature. Flaherty and colleagues (1988) proposed five mutually exclusive major dimensions as a stepwise validation for cross-cultural equivalence. These dimensions included content, semantic, technical, criterion, and conceptual equivalence. Briefly, the content equivalence addresses the cultural relevance of the content of each item of an instrument to the culture being studied. The semantic equivalence stresses the remaining of the same meaning of each item after translation into the language of each culture. Technical equivalence focuses on

comparing the impact of the method of data collection on the results in each culture. The criterion equivalence addresses the interpretation of the measurement when compared with the norm for each culture studied. The conceptual equivalence focuses on the he instrument's ability to assess the same theoretical construct in each culture studied. Flaherty and colleagues indicated that semantic equivalence has been especially difficult to achieve in cross-cultural research. In fact, instruments adapted across cultures are not easy to be equivalent to all five dimensions. However, Flaherty and colleagues argued the goal of instrument developers is to design an instrument with cross-cultural equivalence in these all five dimensions.

Sechrest, Fay, and Zaidi (1972) identified five kinds of equivalence: vocabulary, idiomatic, grammatical-syntactic, experiential, and conceptual. Behling and Law (2000) indicated two kinds of equivalence: semantic equivalence and conceptual equivalence. The semantic equivalence involves ″the choice of terms and sentence structures that ensure that the meaning of the source language statement is preserved in the translation″ (p. 16). The conceptual equivalence refers to ″ the degree to which a concept independent of the words used to operationalize it, exists in the same form in the source and target culture″ (p. 16).

Butcher and Han (1996) described four types of equivalence in cross-cultural research: conceptual, functional, metric, and scalar equivalence. Concept equivalence refers to the comparison of the same constructs that are present across cultures. The functional equivalence refers to that function of a concept is equivalent to that of a

concept in another culture. Butcher and Han (1996) illustrated the act of smiling among Asians and Westerns to express the concept of functional equivalence. They noted that the act of smiling in Asia and America lacks functional equivalence. Asians smile frequently when embarrassed while this is not the case with Westerns. The metric equivalence requires that an instrument possesses similar psychometric properties in data obtained from more that one culture. Metric equivalence can be estimated by evaluating the similarity of two versions of the measure on item difficulty, item-scale correlations, reliability, factor structures and correlation between items or scales Scalar equivalence refers to that a translated instrument can be operating properly in the new culture as well as in the source language culture.

Despite the fact that most cross-cultural researchers emphasize the importance to establishing equivalence, the quantity and the types of equivalence required in a cross-cultural research has no consensus due to the multiple and confusing definition and blurred boundaries of the different types of equivalence. Nonetheless, ensuring that a translated measure with several types of equivalence including the content, conceptual or construct, psychometric or metric, and linguistic or semantic equivalence are required before the instrument is used in research.

Theoretical Framework

The theoretical framework guiding this study is derived from parts of several theories and concepts (see Figure 1).

According to Rogers (1986), environment and human beings are irreducible

energy fields connecting and continuously interacting with one another. There is not boundary existing between human beings and their environments. The combined energy between individual and environment is inseparable and integrated completely. Both human and environmental systems are open and the systems exchange energy continuously and always remain open. Change affects both systems mutually.

The conceptual model proposed by Aiken and colleagues (2002) delineates the mechanisms by which organizational features of hospitals affect patient and nurse outcomes. According to the model, nurses constitute the ongoing surveillance system in hospitals for the early detection of adverse occurrence, complications, and errors. Once a potential problem has been identified, organizational features determine the speed with which the institution responds to intervene and the speed of responding determines the outcomes of patients. Aiken and colleagues (1997) claimed that the organizational attributes of nursing through either hospital or unit-level professional practice models would likely enhance or impede nurses' early detection of complications and, consequently, time interventions.

The Professional Practice Model (PPM) created by the administrative leadership at the Massachusetts General Hospital (MGH) PPE delineates the work and contributions made by nurses across various settings and levels of care within the hospital. The PPM's core elements include: professional staff leadership and autonomy in practice; control over one's practice; collaborative governance stressing staff participation in decision-making about patient care and the environment within which care is delivered;

interdisciplinary communication and teamwork; use of a problem-solving approach to handle disagreements and conflict, enhanced internal work motivation; and delivering culturally sensitive, competent care to patients of all ethnic groups (Ives Erickson et al., 2004). The PPM provides the framework for achieving clinical outcomes.

Leininger's theory of culture care diversity and universality (2001) suggests that nurses needed a comparative view of cultural differences and similarities as the work with people in different environmental contexts. Leininger (2001) noted that ″understanding the why of cultural care differences and similarities among and between cultures would offer explanatory power to support nursing as an academic discipline and practice processions.″(p.35). Understanding people's inside cultural views rather than emphasizing the researchers' externally presumes and pre-set specific ideas is an extremely rich and meaningful research way to obtain full descriptive, accurate, and meaningful data (Leininger, 2001).

The emic-etic distinction is one of the central concepts in cross-cultural research (Brislin, 1980). Brislin (1986) noted that a full understanding of a concept within a culture demands the cultural-specific results, the emic aspects, and the shared meanings across cultures, the etic aspects. The etic refers to ″a phenomenon, or aspects of a phenomenon, which have a common meaning across the cultures under investigation″ (Brislin, 1986, p. 140). In contrast, the emic presents the difference across cultures. A description of the phenomenon for each culture contains both of the etic core and the culture's emic aspects ″ (Brislin, 1986). Tripp-Reimer (1984) noted the benefit of using

emic-etic distinction to synthesize a studies concept. An emic analysis could discover the significant distinctions made by the members of a particular culture. In contrast, etic analysis focusing on examining and comparing several cultures could discover the common features derived across cultures. In conclusion, research on cross-cultural research can benefit through the use of emic-etic distinction to better understand the concept investigated. The emic-etic distinction can allow the research an opportunity to demonstrate the important common concepts in both culture and the cultural-specific concepts within each culture.

Measurement is the process of using a precise procedure to assign numbers to objects to quantify a characteristics or attribute of the object. The goal of measurement is to achieve accurate results. However, measurement error exists, to some extent, during all measuring procedures and affects the precision of results. Reliable measures allow generalizing from one particular use of the method to wide variety of related circumstance. Reliability is necessary but not sufficient condition for validity. No measure is useful in the long run without evidence for its validity. (Nunnally & Bernstein, 1994). The use of existing instruments can build knowledge because it allows systematic comparisons to be made across different cultures, increase data base for evaluating the properties of the instruments themselves, and allows information about a particular concept or variable to cumulate (Waltz, Strickland, & Lenz, 1991).

From the above concepts, the author believe that nurses practice in very complex environments which consists of individual nurses, the nursing professional practice, and

the social context such as government and the public. The professional practice environment for nurses can not be separated from the constructs of persons, health and nursing. The harmony of the dynamic interaction among nursing professional practice environment and nursing can create the meaning of the reciprocal complex metaparadigmatic understanding of nursing, practice environment, health, and persons. As displayed in Figure 1, this study views both of nurses and their practice environment as irreducible energy fields connecting and continuously interacting with one another. The energy that exists between nurse and their practice environment is inseparable, dynamic, changing and integrated to the nurse and patient relationships and patient outcomes. Changes either in nurses' practice environment or nurses will mutually bring about changes in each other. The interaction between nurses and their practice environments create another energy that can have positive or negative impact on patient and nurses outcomes. The impact of environment on patient outcomes will be influenced and changed by the energy interaction between nurses and patients. Nurses practicing within an environment that is supportive of professional staff leadership and autonomy in practice; control over one's practice; collaborative governance stressing staff participation in decision-making about patient care and the environment within which care is delivered; interdisciplinary communication and teamwork; use of a problem-solving approach to handle disagreements and conflict, enhanced internal work motivation; and delivering culturally sensitive, competent care to patients of all ethnic groups, will be able to practice their full potential knowledge and skill achieve desired patient outcomes.

The differences and similarities of the professional practice environment characteristics between American and Taiwan acute care settings can be elicited through the use of a reliable and valid instrument and its translation produced by rigorous translation and cultural adaptation procedures to measure the characteristics of nurses' practice environment. The knowledge of the professional practice environment within a particular culture and across different cultures built up through the eyes of nurses allows an opportunity to guide the creation of a harmony interaction among nursing professional practice environment and nurses in the long run.

Summary

Nurses practice in the environment supportive of their professional practices can have critical contribution to patient outcomes. To implement initiatives that support professional nursing practice is a very critical issue for policy makers (Ritter-Teitel, 2002). The better understanding of nurses' perceptions with their practice environment can help make evidence-based decisions for meaningful initiatives to create an optimal health practice environment for nurses and patients. Translation and adaptation of an existing reliable and valid instrument create an access to measure and understand nurses' practice environment in different countries; to make comparisons of diverse cultural professional practice environment possible; and to build broader cross-cultural knowledge and understanding regarding nurses' professional practice environment.

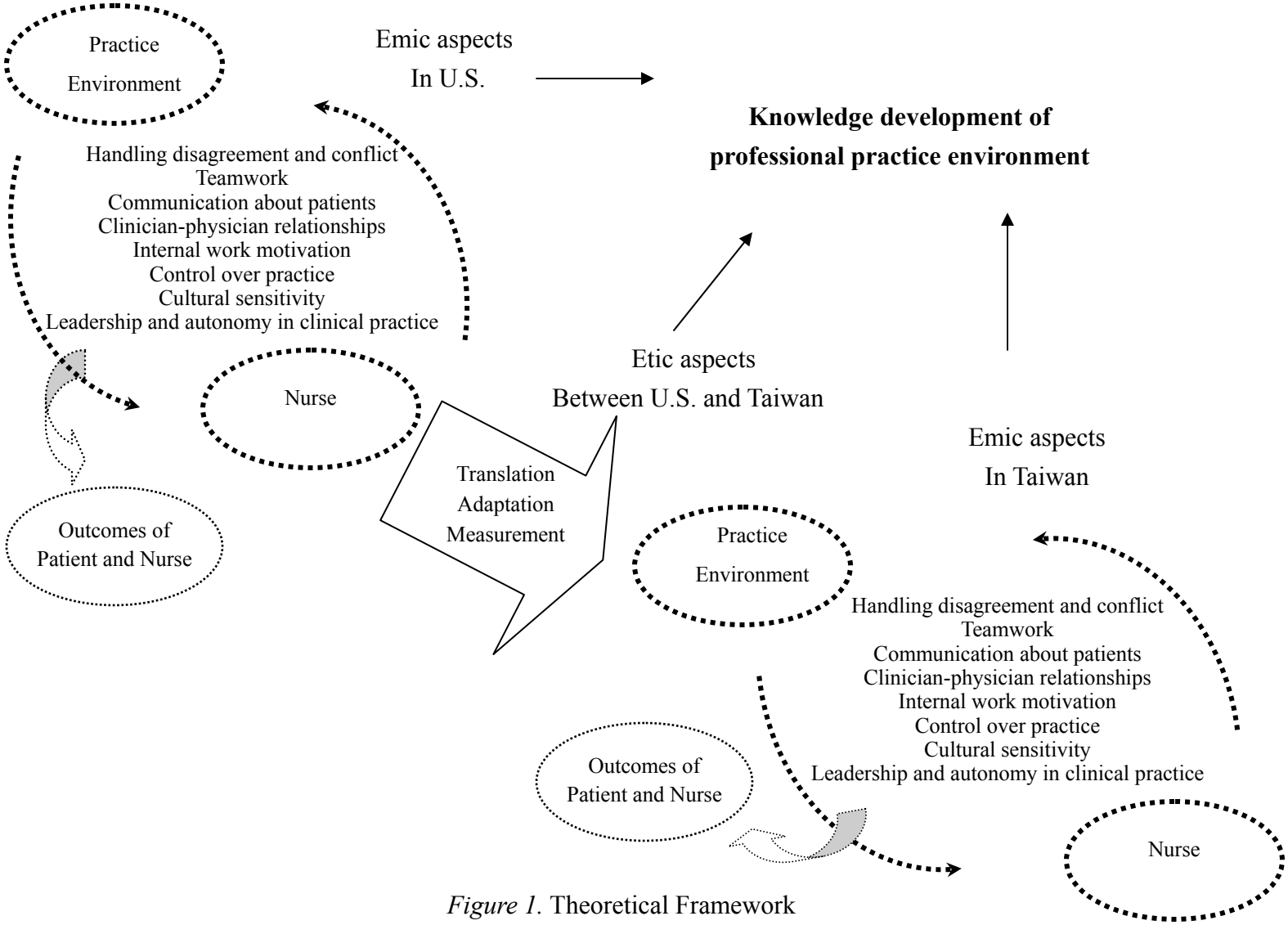

Figure 1. Theoretical Framework

CHAPTER III

METHODS

Introduction

The evaluation of professional practice environment within the health care settings in Taiwan is hindered by the lack of a reliable, valid, and culturally sensitive instrument for measurement. The purposes of this study were to : (a) translate the Professional Practice Environment Scale (PPE) from English to Chinese, (b) evaluate the equivalencies across the translated Chinese version of the PPE Scale with the English version of the PPE Scale, (c) adapt the translated Chinese version of the PPE Scale as needed to produce a culturally sensitive instrument, (d) evaluate psychometric properties of the translated-adapted Chinese version of the PPE Scale in Taiwanese nurses working in acute care settings, (e) determine the extent to which selected demographics and variables explain Taiwanese nurses' perceptions of their professional practice environment. Research questions derived from the purposes of this study were: (a) to what extent can the equivalence of the translated-adapted Chinese version of the PPE Scale as relative to the English version of the PPE Scale be demonstrated through the use of translation and adaptation techniques, (b) to what extent can the psychometric properties of the translated-adapted Chinese version of the PPE Scale be demonstrated in a sample of Taiwanese nurses working in acute care settings, and (c) to what extent do selected demographics and variables explain Taiwanese nurses' perceptions of their professional practice environment.

The research questions within this investigation were answered in two study phases. Phase I focused on translating the English version of the PPE Scale into Chinese and adapting it as needed to fit in Taiwanese culture for measuring the professional practice environment for nurses. Phase II focused on evaluating the psychometric evaluations of the translated Chinese version of the PPE Scale and the adapted Chinese version of the PPE Scale. Research methodology for this study including the study design, sampling, instrument and measurements, protection of human subjects, data collection, and data analysis were elaborated in this chapter.

Study Design

A descriptive cross-sectional, methodological design, based on translation theory (Brislin, 1970), measurement theory (Waltz, Strickland, Lenz, 1991), and psychometric theory (Nunnally & Bernstein, 1994) was be constructed to develop and evaluate the psychometric properties of Chinese version of the PPE Scale. The study was accomplished through two phases: Phase I, instrument translation and adaptation, and Phase II, psychometric evaluation. Phase I was accomplished through two stages, Instrument translation, and instrument validation and adaptation. In Phase I, the original English version of the PPE Scale was translated into Chinese through a set of thorough procedures and its contents were validated and culturally adapted as needed to fit in Taiwanese culture for measuring the professional practice environment for nurses. In Phase II, the psychometric properties of both the translated Chinese and the adapted Chinese versions of the PPE Scales were conducted. The comparison of the psychometric

equivalence between the original English and the translated Chinese version of the PPE Scale were explored within a sample of Taiwanese nurses.

Selection of Instrumentation

There have been several instruments developed to measure nurses' perceptions of the professional practice environment rooted in the English language. But to date none of these instruments have been translated into Chinese. The 38-item PPE Scale is the only instrument that is specifically constructed under a framework of the professional practice model and focused on the development of items for appropriately measuring current nurses' perceptions of the practice work environments. Moreover, the analyses of psychometric properties of the PPE Scale to date support that this instrument is a reliable and valid tool for measuring staff nurses' perceptions of the professional practice environment. Because of this, the PPE Scale has been selected for translation into Chinese and adaptation as needed in order to better reflect the cultural understandings of Taiwanese nurses' perceptions of their professional practice environments.

The Professional Practice Environment Scale (PPE)

The 38-item PPE Scale is the instrument selected for translation and evaluation in this investigation. The PPE Scale was initially developed in the English language using integrated constructs including the magnet hospital concepts and important characteristics of nurses' practice work environments in current acute care settings. The original PPE Scale was developed in late 1998 based on the Professional Practice Model (PPM) that was developed by the administrative leadership at the Massachusetts General Hospital

(MGH) to evaluate the nurses' satisfaction with and effectiveness of the practice environment in supporting clinicians to deliver quality patient care. The initial PPE Scale contained 35 items, which were developed to measure eight organizational characteristics important to the professional practice environment of staff working in acute care settings. These eight organizational characteristics of the professional practice environment were well defined in the literature and even part of the initial development of the PPE Scale (see Table 2).

The 35 items of the PPE Scale were designed using a 4-point Likert scale with SA (strongly agree), A (agree), D (disagree), and SD (strongly disagree) for the participants' responses. The 35 items of the PPE Scale were first validated by seven disciplines at the MGH and then primarily used within MGH from 1999 to 2001 to evaluate the effectiveness of the professional practice environment, monitor trends and recognize changes made over the time period to improve care across and within disciplines.

The initial instrument evaluation of psychometric properties indicated that the consistency reliability using Cronbach's alpha coefficient for 35 item overall scale and for most conceptually derived subscales had satisfactory reliability of Cronbach's alpha >.75. The exception was the internal work motivation subscale with Cronbach's alpha of .63. The developers of the PPE Scale believed that the unsatisfactory internal consistency reliability for the internal work motivation subscale might be the result of insufficient items within this subscale and the relative homogeneity of the respondents' responses on those items. Therefore, four additional items were added into the internal

work motivation subscale, which were conceptually congruent with the definition for internal work motivation subscale and with other scale items in an effort to increase participants' response variation. In addition, one item in the category of the handling disagreement and conflict subscale was split into two items to eliminate its item ambiguity which might lead to respondents' confusions. Consequently, the revised PPE scale contained 40 items (see Table 2). The revised 40-iem PPE Scale was used in 2002 to evaluate staffs' perceptions of the professional practice environment at MGH and to test its psychometric properties with a sample of 849 professional staff across disciplines (Ives Erickson et al., 2004).

The internal consistency reliability for the 40-item PPE Scale using Cronbach's alpha was .93 for the overall scale and ranged from .80 to .89 for the eight hypothesized organizational characteristics. Although the initial internal consistency reliability estimates for the 40-item PPE Scale was satisfactory, two items originally believed to be in the domains of the Internal Work Motivation and Communication about Patients were deleted from the scale due to their unsatisfactory item-total correlation scores (< .30). Two items deleted from the scale were ″Information regarding patient care is relayed without major delays″ and ″I feel bad and unhappy when I discover that I have performed less well than I should". The final number of items used to populate the 8 hypothetic organizational characteristics of the PPE Scale was 38 (see Table 3).

Table 2

Descriptions of Concepts Underpinning the 35-item PPE Scale

Concept	Definition	Number of items
Handling disagreement and conflict	The degree to which managing discord is addressed with a problem-solving approach (Zimmerman et al., 1993).	8
Control over practice	Sufficient intraorganizational status to influence others and deploy resources when necessary for good patient care (Aiken, Havens, & Sloane, 2000; Ives Erickson, Hamilton, Jones, & Ditomassi, 2002).	6
Leadership and autonomy in clinical practice	The quality or state of being self-governing and exercising professional judgment in a timely fashion (Aiken et al., 1997).	5
Internal work motivation	Self-generated encouragement completely independent of external factors such as pay, supervision, or coworkers (Hackman & Oldham, 1976, 1980; Ives Erickson, 2000).	4

Table 2 (continued)

Descriptions of Concepts underpinning the 35-item PPE Scale

Concept	Definition	Number of items
Teamwork	Conscious activity aimed at achieving unity of effort in the pursuit of shared objectives (Zimmerman et al., 1993).	4
Communication about patients	The degree to which patient information was related promptly to the people who need to be informed through open channels of interchange (Shortell, Rousseau, Gillies, Devers, & Simons, 1991).	3
Cultural sensitivity	A set of attitudes, practices, and / or policies that respects and accepts cultural differences (Ives Erickson, 2000).	3
Clinician-physician relationships	Those associations with physicians that facilitated exchange of important clinical information (Aiken et al., 1997).	2

Table 3

Descriptions of Concepts for the 35-item PPE Scale

	40-item PPE (Cronbach's Alpha= .93)		38-item PPE (Cronbach's Alpha= .93)	
Concept	Number of items	Cronbach's Alpha	Number of items	Cronbach's Alpha
Handling disagreement and conflict	8	.89	8	.88
Internal work motivation	8	.83	7	.86
Control over practice	7	.81	7	.82
Leadership and autonomy in clinical practice	5	.83	5	.83
Teamwork	4	.83	4	.78
Cultural sensitivity	3	.80	3	.78
Communication about patients	3	.87	2	.80
Clinician-physician relationships	2	.83	2	.79

The principal component analysis (PCA) with varimax rotation and Kaiser normalization revealed the presence of eight parsimonious and interpretable solutions within the remaining 38 items. All 38 items loaded as expected to the eight hypothesized dimensions with loading value greater than .30. The eight extracted factors accounted for 61% of the variance between the 38 items. The 8 extracted factors were labeled as

follows: handling disagreement and conflict (eight items), control over practice (seven items), internal work motivation (seven items), leadership and autonomy in clinical practice (five items), teamwork (four items), cultural sensitivity (three items), communication about patients (two items), and staff relationships with physician (two items). Most of the extracted factors contained the same items of the originally hypothesized concepts except two factors: ″leadership and autonomy in clinical practice″and ″control over practice”. Item 14 (Not being placed in position of having to do things against my professional judgment) originally labeled as an item in the domain of Leadership and Autonomy in Clinical Practice loaded into the domain of Control over Practice. Item 9 (A manager who is a good manager and leader) originally believed as an item in the domain of Control over Practice loaded into the domain of Leadership and Autonomy in Clinical Practice. The Cronbach's alpha internal consistency reliability was .93 for the overall scale and ranged from .78 to .88 for the eight extracted factors in the 38-item PPE Scale (see Table 3). In general, the psychometric properties support the belief that the 38-item PPE Scale is a reliable and valid tool for measuring 8 critical components of the professional practice environment of staff working in acute care settings.

Cultural Sensitivity and Instrument Development

Cultural influences impact on the usefulness of an instrument and can lead to measurement problems if not addressed in tool development and translation. The relevance and meaning of selected concepts used in an instrument among different

cultures should be valued (Kristjansson, Desrochers, & Zumbo, 2003). It is inappropriate to simply translate an instrument from one language to another without the consideration about the difference of the phenomenon under study among cultures (Hyrkas, Appelqvist-Schmidlechner, & Oksa, 2003). The findings achieved using an instrument without cultural validity could lead results that have little value. Before introducing an instrument to a target culture, it is important to validate that the content of an instrument developed in another culture captures the important issues relevant to the target culture (Hyrkas et al., 2003; Kristjansson et al., 2003). Careful attentions to issues of linguistic and cultural equivalence highlighted in this study are of significant importance to researchers using the instrument across cultural groups. Hence, before translating the PPE Scale into Chinese, adapting the tool as needed and evaluating its psychometric properties with a sample of Taiwanese nurses, to ensure the relevance of this study to Taiwanese nurses the researcher undertook a pilot study during the summer of 2004 to verify the relevance of organizational characteristics of the original PPE Scale within the Taiwanese culture.

The Pilot Study

The purpose of the pilot study was to investigate the usefulness of the organizational characteristics of the original PPE Scale to Taiwanese nurses within acute care settings. An expert panel was used to validate the sensitivity of the original PPE Scale to Taiwanese practice culture. In the summer of 2004, the researcher invited ten Taiwanese nursing administrators to serve as expert panel to evaluate the relevance of the

proposed organizational characteristics of the original PPE Scale to Taiwanese nursing practice culture. This approach improves the likelihood of obtaining a comprehensive perspective for the practical value of the original PPE Scale in Taiwan. Panel members were purposely selected in this pilot study because they were known to have expertise in nursing administration and were familiar with nursing practice environments. Their opinions were thought to reflect the vision of the professional practice environment in the hospital studied from nursing administrator's perspectives. This was considered important because the intent of this study is to develop a valid instrument sensitive to Taiwanese culture for use by nursing administrators to understand nurses' perceptions of the professional practice environment. The results of evaluation could serve as evidence for further decision making for policies and outcome evaluations of policies implemented.

The 10 panel members worked in a medical center in the northern area of Taiwan. They were educated at the master's level. Six of the panel members were working as nursing supervisors, three as nursing associate directors, and one as a nursing pre-director and present leader at the administration center.

The Concept Validity Questionnaire of the PPE Scale was developed by the investigator to assess the usefulness of the organizational characteristics of the original PPE Scale (Ives Erickson at al., 2004) within the Taiwanese acute care settings. The Concept Validity Questionnaire of the PPE Scale contained nine items including both English and Chinese definitions of the eight organizational characteristics of the original

PPE Scale and one open-ended question for evaluation of the completeness of the PPE Scale. All of the nine items were placed on a dichotomous scale of agreement and disagreement for experts' responses. A comment area was provided along with each item to allow the experts to further express their thoughts as needed. According to the definitions of the organizational characteristics, these Taiwanese experts were asked to rate their agreements on the usefulness and comprehensiveness of the organizational characteristics found in the original PPE Scale with the special consideration to cultural sensitivity and the meanings of the terms used by Taiwanese nurses. Respondents were first asked to rate the usefulness of each of the organizational characteristic from the original PPE Scale and then comment on each organizational characteristic. Finally, the experts were asked to rate the overall comprehensiveness of the organizational characteristics used in the PPE Scale and provide comments. The concept validity index (CVI) for each concept was calculated based on experts' ratings by adopting Lynn's method for computing content validity index (1986) and estimating quantitative evidence of the usefulness of the eight focal concepts in the PPE Scale in Taiwanese culture. The concept validity of each concept was determined by computing the proportion of experts who agree the organizational characteristic is useful in Taiwanese culture. The concept validity index for the total eight organizational characteristics was computed by summing the percentage agreement scores of the concepts that were given a rating of ″agreement″by the experts.

The results indicated that most of the organizational characteristics were totally

agreed (100%) by the ten Taiwanese nurse administrators supporting the usefulness of the organizational characteristics in Taiwan. On concept, cultural sensitivity, only nine experts agreed (90%) with its usefulness. The usefulness of the 8 organizational characteristics ranged from .90 to 1.0.The average percentage of agreement for the usefulness of these 8 organizational characteristics in the PPE Scale was 98.75%. The values of CVI over .80 supported that it's useful in Taiwan (Lynn, 1986; Waltz, Strickland & Lenz, 1991). With regard to comprehensiveness, six experts agreed (60%) that the 8 organizational characteristics included in the PPE Scale were comprehensive.

The results indicated that the current concepts developed in the instrument are useful in measuring Taiwanese nurses' professional practice environments. However, the instrument did not completely include all the concepts important to Taiwan culture according to the Taiwanese experts' opinions. The results of the evaluation of the organizational characteristics of the PPE Scale by the panel of Taiwanese clinical expert supported the appropriateness of using the PPE Scale in Taiwanese acute care settings to evaluate nurses' perceptions of the professional practice environments. In general, the pilot results supported the feasibility of further translating the PPE Scale into Chinese and evaluating its psychometric properties with Taiwanese nurses. However, the pilot results also demonstrated a need to adapt the translated Chinese version of the PPE Scale to fit in Taiwanese culture for measuring nurses' professional practice environments.

Phase I: Instrument Translation and Adaptation

The study began from September of 2005 after the permissions from the tool

developer of the PPE Scale at MGH (see Appendix A) and the approval of the Institutional Review Board of Boston College were obtained. As shown in Figure 2, establishing the psychometric properties for the translated Chinese version of the PPE Scale and the adapted Chinese versions of the PPE Scale was accomplished through several procedures which include the following: forward translation, back translation, test of translation equivalence, content validation, cultural adaptation, pre-testing, and psychometric evaluation.

The goals of Phase I included (a) producing an accurate translation of the PPE Scale, written in Chinese, (b) validating the translated Chinese version of the PPE Scale and (c) adapting the translated Chinese version of the PPE Scale as needed to fit in Taiwanese practice culture. These three goals were accomplished in two stages: (a) Stage I, instrument translation, and (b) Stage II, instrument validation and adaptation.

In Stage I, multiple translation techniques were applied to produce a translated Chinese version of the PPE Scale. In Stage II, the content of the translated Chinese version of the PPE Scale was first be validated by Taiwanese experts and a focus group and then adapted as needed to fit in Taiwanese practice culture for measuring nurses' professional practice environments in acute care settings. The research methodology including sampling, instrument and measurement, data collection and data analysis is elaborated in the following pages.

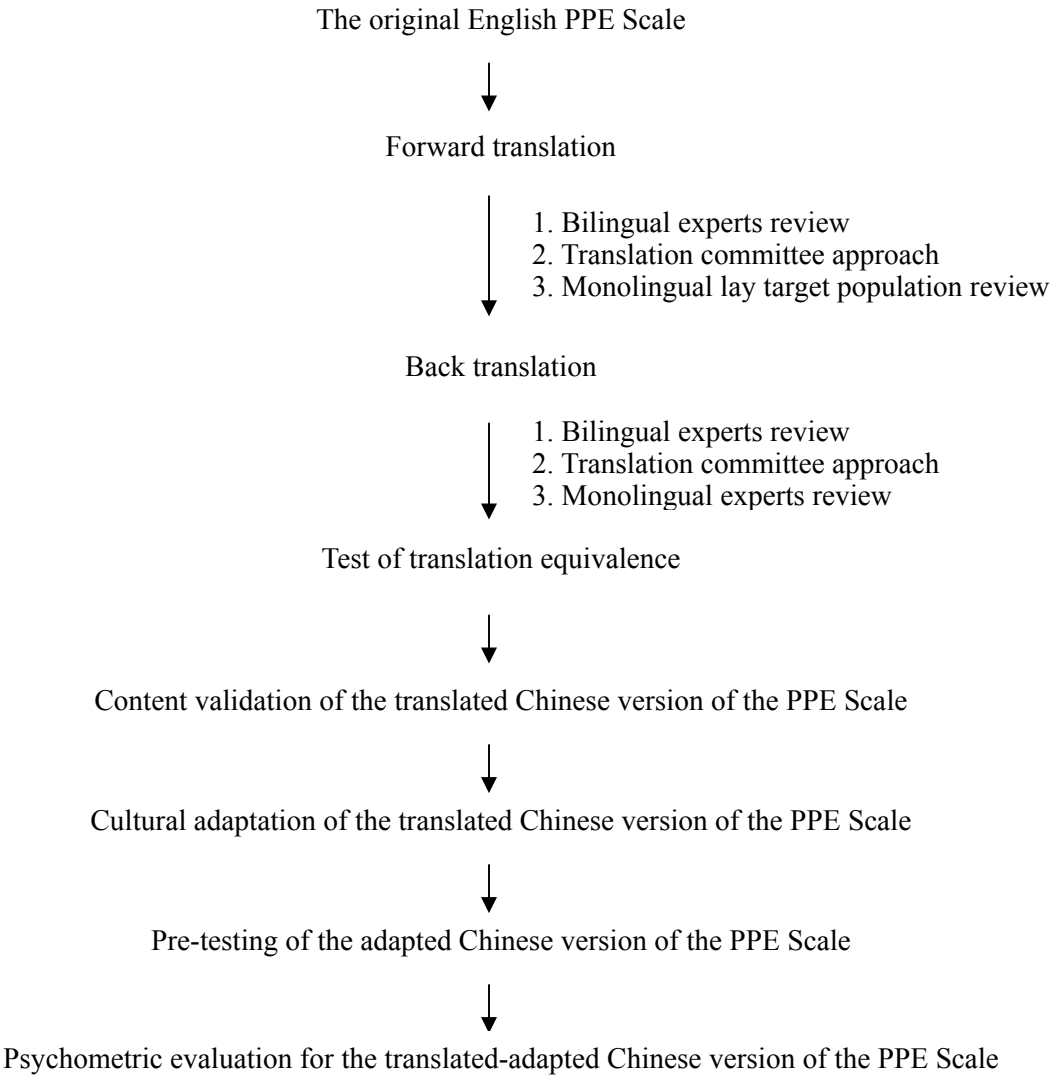

Figure 2. Procedures of Establishing Psychometric Properties for the Translated-Adapted Chinese Version of the PPE Scale

Stage I Instrument Translation

Instrumentation

Eight forms were utilized during Stage I, Instrument translation (see Table 4). These forms were elaborated as follows:

1. Forward translation sheets. In order to facilitate the forward translation, the researcher developed the Forward Translation Sheets (see Appendix B) for translators who translated the PPE Scale from English into Chinese. The Forward Translation Sheet packet contained a cover letter, a translation guide, and translation sheets. The purpose of the study, importance of forward translation, required concerns for performing forward translation and contributions were described in the cover letter. The translation guide emphasized the goal of the translation in the study, describe concerns for translating the PPE Scale from English into Chinese and provide a way to document the translation results onto the translation sheets. The concepts, definitions and 38 items of the PPE Scale were presented to the translators and organized in a line-by-line format on the translation sheets, to facilitate the completeness of the translation. In addition, comment areas were provided along with every translated item to allow the translators to describe any difficulties in translation. This approach allowed the researcher to better understand how the contents were being translated so that the accuracy of the forward translation can be better evaluated.

2. Translation equivalence questionnaire for original English and translated Chinese versions of the PPE Scale. The researcher developed the Translation Equivalence

Questionnaire for Original English and Translated Chinese versions of the PPE Scale (see Appendix C) for bilingual experts to evaluate the accuracy of the forward translation. During Stage I, the translators were asked to translate the PPE Scale from English into Chinese. The Translation Equivalence Questionnaire packet contained a cover letter, a review guide, and the translation equivalence questionnaires. The cover letter described the purpose of the study, importance of evaluating the translation equivalence, required concerns for evaluating the translation equivalence and contributions. The review guide contained the goal of the translation in the study and methods to evaluate and document the translation equivalence. The translation equivalence sheets contained directions for evaluation by the translators and concepts, definitions and the 38 items of the Original English version of the PPE Scale as well as those of the translated Chinese version of the PPE Scale. The translation equivalence sheets included 38 4-point Liker scales with rating of 1 (totally different), 2 (the item needs major revision to be equivalent), 3 (the item needs minor revision to be equivalent), and 4 (equivalent) for bilingual experts' responses to the translation equivalence. Comment areas were provided for experts to suggest revisions for any concept, definition, and on any item with rating scores below 4 and not perceived equivalent to the original English version of the PPE Scale. The scoring method of this instrument used the method proposed by Tang and Dixon (2002). Translation Validity Index (TVI) was calculated based on experts' ratings by adopting Lynn's method of computing content validity index (1986) for estimating translation equivalence between the original English and the translated Chinese version of the PPE

Scale (Tang & Dixon, 2002). The translation equivalence for every concept, definition and item was determined by the proportion of experts who rate on score 3 or 4. TVI of the total instrument was computed by summing the percentage agreement scores of the concepts, definitions and items that are given a rating of ″3 or 4″by the experts. According to Tang and Dixon (2002), a desired higher standard for translation equivalence in this study was determined by that TVI achieved 80% agreement on assessments rated on a score of 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument.

3. Monolingual reviewer questionnaire for the translated Chinese version of the PPE Scale. The researcher developed the Monolingual Reviewer Questionnaire for the Translated Chinese Version of the PPE Scale (see Appendix D) for monolingual reviewers whose mother language is Chinese. This scale was used to evaluate the understandability, clarity, and readability of the translated Chinese version of the PPE Scale. The monolingual reviewers received the Monolingual Reviewer Questionnaire packet containing a cover letter, a review guide, and reviewer questionnaires. The purpose of the study, importance of evaluating the translation contents, required concerns for evaluation and contributions of the evaluation of the translation equivalence were described in the cover letter. The criteria for evaluation and an example of how to complete the reviewer questionnaires were described in the review guide. The reviewer questionnaires included the directions for evaluation and 38 items translated Chinese versions of the PPE Scale.

In the reviewer questionnaires, each of the 38 items was placed with three 4-point Likert scales for monolingual reviewers' responses to the understandability, clarity, and readability of the Translated Chinese version of the PPE Scale. The 4-point Likert scale for evaluating understandability was defined as follows: 1 = item is not easily understood; 2 = item needs major revision to be easily understood; 3 = item needs minor revision be easily understood; and 4 = item is easily understood. The 4-point Likert scale for evaluating clarity was defined as follows: 1 = item is not well written; 2 = item needs major revision; 3 = item needs minor revision; and 4 = item is well written. The 4-point Likert scale for evaluating readability was defined as follows: 1 = item is not easy to read; 2 = item needs major revision to be easy to read; 3 = item needs minor revision to be easy to read; and 4 = item is easy to read. According to Marin and Marin (1991), the use of a translation probe access by asking respondents to express their understanding of the item gives the researcher an opportunity to better estimate the accuracy and appropriateness of the translation. Therefore, a comment area for each of the 38 items was provided for reviewers to briefly describe their thoughts about what each item intends to ask.

The scoring method of this instrument adopted Lynn's (1986) method of computing Content Validity Index (1986) for estimating the understandability, clarity, and readability of the translated Chinese version of the PPE Scale. The Understandability Index (UI), Clarity Index (CI), and Readability (RI) for every item were determined by the proportion of experts who rate items on score 3 or 4. UI, CI, and RI scores of the total instrument were computed by summing the percentage agreement scores of the items that

are given a rating of ″3 or 4″by the experts. A desirable higher standard value for UI, CI, and RI in this study was set as that at least 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang and Dixon, 2002).

The item intentions comments were analyzed by the researcher. Comments reported by the monolingual reviewers was rated on scores ″0″for that the meaning is misunderstood and score ″1″for that the meaning is not misunderstood. A desirable value for item intention was set as that at least .80 of assessments rated on score 1 for each of the 38 items by modifying the criteria for content validity proposed by Waltz, Strickland and Lenz (1991).

4. Back translation sheets. In order to facilitate the backward translation, the researcher developed the Back Translation Sheets (see Appendix E) for translators who completed back translation of the PPE Scale from Chinese into English. The Back Translation Sheet packet contained a cover letter, a translation guide, and backward translation sheets. The cover letter contained a description of the study, importance of backward translation, required concerns for performing back translation and the contributions of this work. The translation guide described the goal of translation in this study, concerns related to back translating the PPE Scale from English into Chinese and the way to document the translation results onto the translation sheets. The concepts, definitions and 38 items from the translated Chinese version of the PPE Scale were well organized in a line-by-line format in the translation sheet to facilitate the completeness of

the translation. In addition, comment areas were provided along with every translated item on the translation sheet to allow the translator an opportunity to describe the difficulties in translation. This approach gave the researcher a better understanding about how the contents have been translated and helped the research to judge the accuracy of the backward translation early in the process.

5. Translation equivalence questionnaire for translated Chinese and back-translated English versions of the PPE Scale: The researcher developed the Translation Equivalence Questionnaire for Translated Chinese and Back-Translated English Versions of the PPE Scale (see Appendix F). This was prepared for bilingual experts to evaluate the quality of the back translation in which the translators back translate the PPE Scale from Chinese into English. The Translation Equivalence Questionnaire packet contained a cover letter, a review guide, and translation equivalence questionnaires. In the cover letter, the purpose of the study, the importance of evaluating the translation equivalence, the concerns for evaluating the translation equivalence and contributions of this evaluation work were described. The goal of translation in this study, the methods used completing the translation equivalence and the way to fill in the translation equivalence sheets were described in the review guide. The translation equivalence sheets included directions for evaluation, concept, definitions and the 38 items from the translated Chinese version of the PPE Scale and the 38 items from the back-translated English version of the PPE Scale with a 4-point Liker scale with ratings of 1 (totally different), 2 (the item needs major revision to be equivalent), 3 (the item

needs minor revision to be equivalent), and 4 (equivalent) for bilingual experts' responses to the translation equivalence. Comment areas were also provided for experts to suggest revisions for any concepts, definitions, and items found on the back translated version of the PPE Scale and perceived by evaluators not to be equivalent to the translated Chinese version of the PPE with rating scores less than 4.

The scoring method of the translation equivalence scale was evaluated using the method proposed by Tang and Dixon (2002). Translation Validity Index (TVI) was calculated based on experts' ratings by adopting Lynn's method of computing content validity index (1986) for estimating translation equivalence between the original English of the PPE Scale and the translated Chinese version of the PPE Scale (Tang & Dixon, 2002). The translation equivalence for each concept, definition and item was determined by the proportion of experts who rate items on a score 3 or 4. The TVI of the total instrument was computed by summing the percentage agreement scores of the concepts, definitions and items that are given a rating of ″3 or 4″by the experts. According to Tang and Dixon (2002), this study set the desired higher standard for translation equivalence as that TVI achieved 80% agreement on assessments rated on score 4 for every item and 100% of assessments rated on score 3 or 4 for the entire instrument.

6. Translation equivalence questionnaire for original English and back-translated English versions of the PPE Scale. The researcher developed the Translation Equivalence Questionnaire for Original English and Back-Translated English Versions of the PPE Scale (see Appendix G) for monolingual experts whose are the persons developing the

original PPE Scale to evaluate the quality of translation. The Translation Equivalence Questionnaire for Original English and Back-Translated English Versions of the PPE Scale contained a cover letter, a review guide, and translation equivalence questionnaires. The cover letter included the purpose of study, importance of evaluating the translation equivalence, required concerns for evaluating the translation equivalence and the contributions of the evaluations. The review guide described the goal of translation in this study, methods to evaluate the translation equivalence and the translation equivalence sheets to be completed. The translation equivalence sheets included the directions for evaluation and all of the concepts, definitions and the 38 items from the original English version of the PPE Scale and those from the back-translated English version of the PPE Scale. In the translation equivalence sheets, each item contained a 4-point Liker scale with ratings of 1 (totally different), 2 (the item needs major revision to be equivalent), 3 (the item needs minor revision to be equivalent), and 4 (equivalent) for monolingual experts' responses to the translation equivalence. A comment area was provided for experts to write down problems in any concepts, definitions, and items on the back translated English version of the PPE Scale with a rating less than 4 scores when translators felt the contents are not equivalent to the original PPE Scale and could lead to differences in meaning.

The scoring method of the instrument employed the method proposed by Tang and Dixon (2002). The TVI was calculated based on experts' ratings by using Lynn's method of computing content validity index (1986) for estimating translation equivalence

between the original English and the translated Chinese versions of the PPE Scale (Tang & Dixon, 2002). The translation equivalence for each concept, definition and item was determined by the proportion of experts who rate on score 3 or 4. The TVI of the total instrument was computed by summing the percentage agreement scores of the concepts, definitions and items that are given a rating of ″3 or 4″by the experts. According to Tang and Dixon (2002), a desired higher standard for translation equivalence for this study was set as that TVI achieved 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument.

7. Back- translated English version of the PPE Scale. The researcher provided the Back-Translated English Version of the PPE Scale (see Appendix H) for monolingual participants when testing the translation equivalence. The Back-Translated English Version of the PPE Scale was produced after that accurate and complete forward and back translation procedures were completely accomplished and item on the translated Chinese version of the PPE Scale were ensured not to be discrepant from the original English version of the PPE Scale. The Back-Translated English Version of the PPE Scale packet contained a cover letter and the 38 back translated English items. The cover letter described the purpose of the study, procedures for data collection, protections of human subjects, and contributions. Each of the 38 items on the back-translated English version of the PPE Scale was placed with a 4-point Liker scale of 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree) for participants' responses to the statements for every items.

8. Translated Chinese version of the PPE Scale. The researcher gave the translated Chinese Version of the PPE Scale (see Appendix I) to bilingual participants when testing the translation equivalence. The Translated Chinese Version of the PPE Scale was produced after that accurate and complete forward and back translation procedures were completely accomplished and item on the translated Chinese version of the PPE Scale were ensured not to be discrepant from the original English version of the PPE Scale. The Translated Chinese Version of the PPE Scale packet contained a cover letter and the 38 translated Chinese items. The cover letter described the purpose of the study, procedures for data collection, protections of human subjects, and contributions. The 38 translated Chinese items were placed on a 4-point Liker scale of 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree) for participants' responses to the statements for every items.

Sampling

Six different samplings were performed in this stage. These included the recruitment of translators, bilingual experts, monolingual reviewers, monolingual experts, monolingual participants for validating translation equivalence and bilingual participants for validating translation equivalence. These sampling methods are elaborated below:

1. The recruitment of translators. In this study, the major characteristics for qualifying translators were knowledge and experiences are (Marin & Marin, 1991). The coordinate bilingual who learned the languages at different time and, preferably, in two different cultures was the preference of recruiting translators in this study because of their

better ability to articulate the cultural meaning of the words (Marin & Marin, 1991). Coordinate bilinguals who have nursing or health professional relevant backgrounds were recruited to be translators in this study. In addition, concerns about that the number of translators has impact on the quality of translation were addressed by having multiple translators included in this study (Mimura & Griffiths, 2004). Multiple translators independently translating in parallel can help avoid bias that only one translator might have (Marin & Marin, 1991; Banville, Desrosiers, & Genet-Volet, 2000) and control the quality of translation (Maneesriwongul & Dixon, 2004). In order to pursue a quality translation, four bilingual and bicultural translators, who matched the inclusion criteria for translators, were recruited and paired into two groups for the forward and back translation processes in this study. Each translation group included two translators who worked independently during the translation process to facilitate the accuracy of translation and the meaning of words. The optimal goal for the composition of the translation groups was that each translating group included one translator majoring in nursing or health care relevant program and the other translator majoring in English language relevant programs. The qualification of the four bilingual and bicultural translators in this investigation matched a set of common criteria including: (a) having experience living in Taiwan and American, and being familiar with both cultures, (b) fluent in reading, speaking, and writing and understanding both English and Mandarin Chinese, (c) having at least a master's degree, and (d) majoring in nursing, medicine, or English language relevant programs. The criteria for grouping the two translators into the

forward translation group to translate the PPE Scale from English into Chinese were: (a) speaking Mandarin Chinese as first language, and (b) having graduated from a university in America. The criteria for grouping the two translators into the back translation group to translate the PPE Scale from Chinese into English included: (a) speaking English as first language, and (b) having no knowledge about the content of the original PPE Scale.

The four eligible bilingual translators recruited in this study were Taiwanese. The two translators in forward translation group were female. Both of them was living and working in Taiwan. The first translator owned a Bachelor's degree in English Language and Literature in Taiwan and a Master's degree in Educational Media and Technology in America. The first translator had the experience of working in a translation center and serving as Executive Secretary at a teaching hospital in Taiwan. The second translator completed her Master's degree and Doctoral degree in nursing in America. She had the experience of developing a questionnaire and evaluating the psychometric properties. She was serving as an Associate Professor at a nursing school in Taiwan.

The two bilingual translators in back translation group were male researchers. Both of them were PhD and had been lived in America over seven years. The first translator owned dual Master's degrees. He completed his Master degrees in Physiology and in Neuroscience in Taiwan. He completed his Doctoral Degree in Neuroscience in the United States. He had been working as a researcher at a hospital in America since 2000. The second translator received his Master degree in Biochemistry in Taiwan and Doctoral Degree in Pharmacology in the United States. He had been working as a researcher at a

University in American since 2004.

2. *The recruitment of bilingual experts*. The use of experts to evaluate the linguistic appropriateness and equivalence of translation could better estimate the quality of translation (Marine& Marine, 1991). Rigorous comparisons between the source language and target language versions by independent bilingual experts will strengthen the accuracy of translation (Tang & Dixon, 2002). To evaluate the translation equivalence and pursue a quality translation, this investigation recruited ten bilingual and bicultural experts, who matched the inclusion criteria. The eight experts were randomly paired into two panels to participate in validating the translation equivalence for the forward and back translation processes in the study. Each of the expert panels was composed of five bilingual experts who worked independently to evaluate the translation equivalence and to made revision as needed to improve the accuracy of translation and the meaning of words.

The five bilingual experts in Panel A were asked to compare the equivalence between the original English version of the PPE Scale and the translated Chinese version of the PPE Scales. The other four bilingual experts in Panel B were asked to compare the equivalence between the translated Chinese version of the PPE Scale and the back-translated English version of the PPE Scale. The qualifications of bilingual experts matched the following criteria: (a) fluent in reading, speaking, and writing and understanding both English and Mandarin Chinese, (b) having experience living in Taiwan and America, and being familiar with both cultures, (c) having at least a master's

degree, and (d) majoring in nursing, health care, or English language relevant programs.

The ten recruited bilingual experts were Taiwanese. The ten recruited bilingual experts were all familiar with nurses' work environment in hospitals. The five bilingual experts in Panel A included four women and one man. Two experts completed their doctoral study in the Unites States and were serving as physicians in Taiwan. One expert completed her Bachelor degree and Master Nursing study in the United States and were serving as a nursing supervisor at a local teaching hospital in Taiwan. Two experts completed their Master nursing study in the United States and were studying in Doctoral nursing programs in the United States. The five bilingual experts in Panel B were Taiwanese female. These five experts were serving as nursing faculties at a university in Taiwan. Four of the experts completed their Master nursing study in Taiwan and the Doctoral nursing study in the United States. One expert completed her Master Nursing study in the United States and was studying in doctoral nursing programs in the United States.

3. The recruitment of monolingual reviewers for the translated Chinese version of the PPE Scale. In order to ensure the translated items are natural sounding and meaningful to Taiwanese nurses, the researcher used snowball method to recruit a convenient sample of 5 Taiwanese nurses resembling the target language population to pilot test the contents of the translated Chinese version of the PPE Scale (Beck, Bernal, & Froman, 2003; Marine & Marine, 1991). The participants were encouraged to introduce any other potential participants who match the inclusion criterion to the researcher. Then

the researcher were also contact the potential participants for further recruitment. The inclusion criteria were: (a) being a nurse working in Taiwanese acute care settings, and (b) willing to take apart in the study. The five Taiwanese nurses were recruited from outside the studied hospital to prevent potential bias in future data collection. The five recruited Taiwanese female nurses had an average of 1.3 years of working as registered nurses. Three nurses owned a Bachelor degree in nursing. Two nurses owned a diploma in nursing.

4. The recruitment of monolingual experts for the back-translated English version of the PPE Scale. In order to estimate the accuracy of the translation, three native English speakers who initially developed the original English version of the PPE Scale were invited to serve as monolingual reviewers to evaluate the equivalence between the original and the back-translated English version of the PPE Scale in this study (Marine & Marine, 1991). The three monolingual experts all completed doctoral nursing study. Two experts served both as a faculty at a nursing school and as a nursing scientist at a hospital. One expert was a major nursing administrator in a hospital.

5. The recruitment of monolingual participants for testing translation equivalence. Pre-testing the translated instrument with monolingual participants to evaluate the translation equivalence was utilized in this study, (Marine & Marine, 1991). The inclusion criteria for the monolingual participants were: (a) having the ability to read and understand English, (b) working as a health professional in acute care settings in America, and (c) willing to take part in the study. The participants were encouraged to introduce

any other participants who match the inclusion criteria of bilingual participants in this study to the researcher. Then, the researcher contacted the potential participants for further recruitment.

A convenience sample of 10 monolingual participants was recruited using a snowball method in this study to test the translation equivalence between the original English and the back-translated English versions of the PPE Scales. The 10 recruited monolingual reviewers were American female nurses. The participants ranged in age from 25 to 53 (mean age = 40.13 years).They had an average of 212 months of working as registered nurses. Most of the participants completed Mater nursing study (70%) and were serving as Nursing Practitioner (70%).

6. The recruitment of bilingual participants for testing translation equivalence. Pre-testing the translated instrument with bilingual participants to evaluate the translation equivalence was utilized in this study (Marine & Marine, 1991). The sample size necessary for conducting correlation coefficients between the source and the target languages was estimated based on the statistic concepts. In ordered to meet the assuming a statistical power of .80, an alpha level of .05 and an effect size of .50 (Polit & Hungler, 1999), a convenience sample of 35 bilingual participants was recruited using a snowball method in this study to test the translation equivalence between the original English and the translated Chinese versions of the PPE Scales. The inclusion criteria were: (a) having ability to read and understand both Chinese and English, (b) working as a health professional in acute care settings regardless of where he or she is working at the time of

study, and (c) willing to take apart in the study.

Most of them were female (97.1%). Only one male nurse was recruited. Most of the participants owned Bachelor degree in nursing (88.6%). Four of them completed a Master nursing study. The participants ranged in age from 23 to 45 (mean age = 32.17 years). They had an average of 124.5 months of working as a registered nurse. Eighteen participants worked in general ward (51.4%) and 17 participants worked in ICU (48.6%). Most of the participants served as staff nurses (68.6%) and 11 of them served as Nursing Specialist (31.4%).

Translation Procedures

In order to compare the psychometric properties of the original English PPE Scale and the translated Chinese version of the PPE Scale, the original English PPE Scale was forward and backward translated with the use of decentering strategy to minimized cultural bias and maximize the equivalence between language versions (Brislin, 1970; Jones, 1986). Multiple translation techniques will be used in this study, because there is no single perfect translation technique (Maneesriwongul & Dixon, 2004). A comprehensive, multistep translation which includes forward translation, blind back translation, repetition of forward-back-translation, and the use of bilingual speakers, is essential for the successful translation, (Bracken, & Barona, 1991). The use of committee approach can also help reach semantic equivalence between the source and target languages (Brislin, 1970). In this study, multiple techniques including forward and back translation, multiple translators, panel discussion, bilingual and monolingual experts'

evaluations, pre-testing with target monolinguals, testing translation equivalence with bilinguals and monolinguals were used to most accurately translate the PPE Scale. To ensure accuracy in the translation of the PPE Scale, the translation approaches demonstrated in Figure 3 and adapted from several researchers (Banville, Desrosiers, & Genet-Volet, 2000; Beck, Bernal, & Froman, 2003; Brislin, 1970; Dela Cruz, Padilla, & Agustin, 2000; Drasgow, & Hulin, 1987; Geisinger, 1994; Guillemin, Bombardier, & Beaton, 1993; Kristjansson, Desrochers, & Zumbo, 2003, Marine & Marine, 1991; Tang & Dixon, 2002) were employed.

As displayed in the Figure 3, the forward translation was accomplished through step 1 to 5 and the evaluation of the translation equivalence for forward translation was performed from step 6 to 10 (see Figure 3). The backward translation was accomplished through step 11 to 15 and the evaluation of the translation equivalence for backward translation went through step 16 to 20 (see Figure 4). Overall, the translation procedures was not ended until all translated items were consistent with the original PPE scale through cyclic sequence of steps 1 to 20 (see Figure 5).

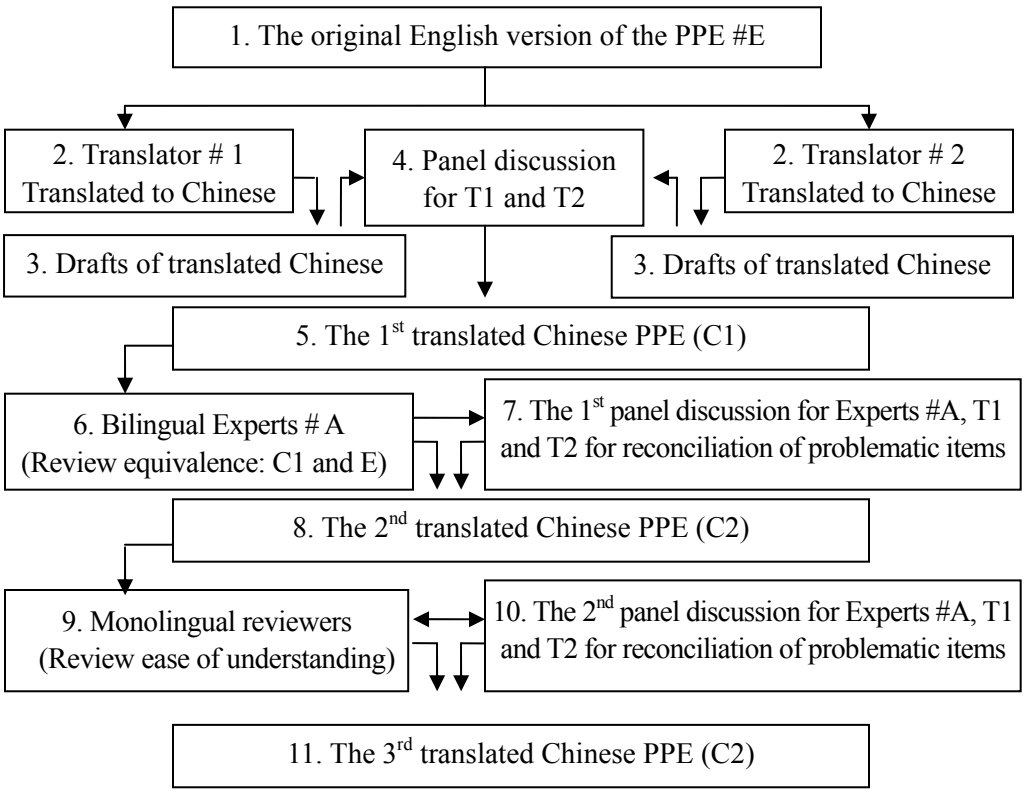

Figure 3. Forward Translation Procedures of the PPE Scale

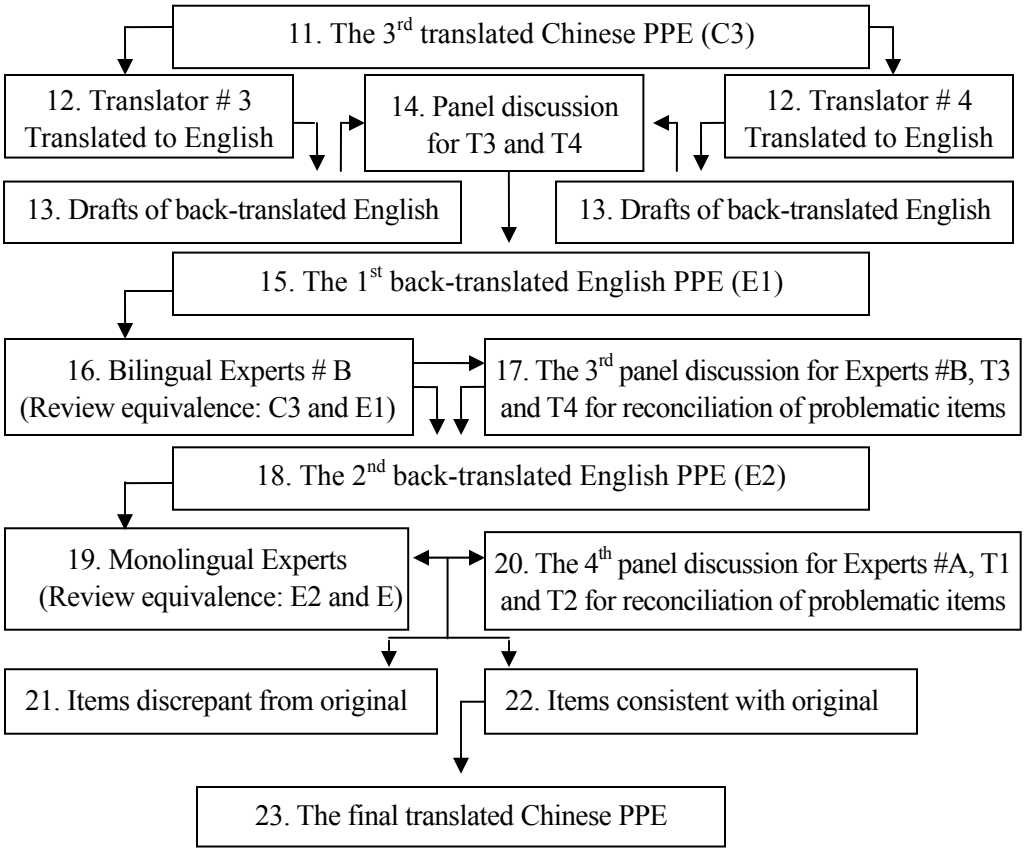

Figure 4. Back Translation Procedures of the PPE Scale

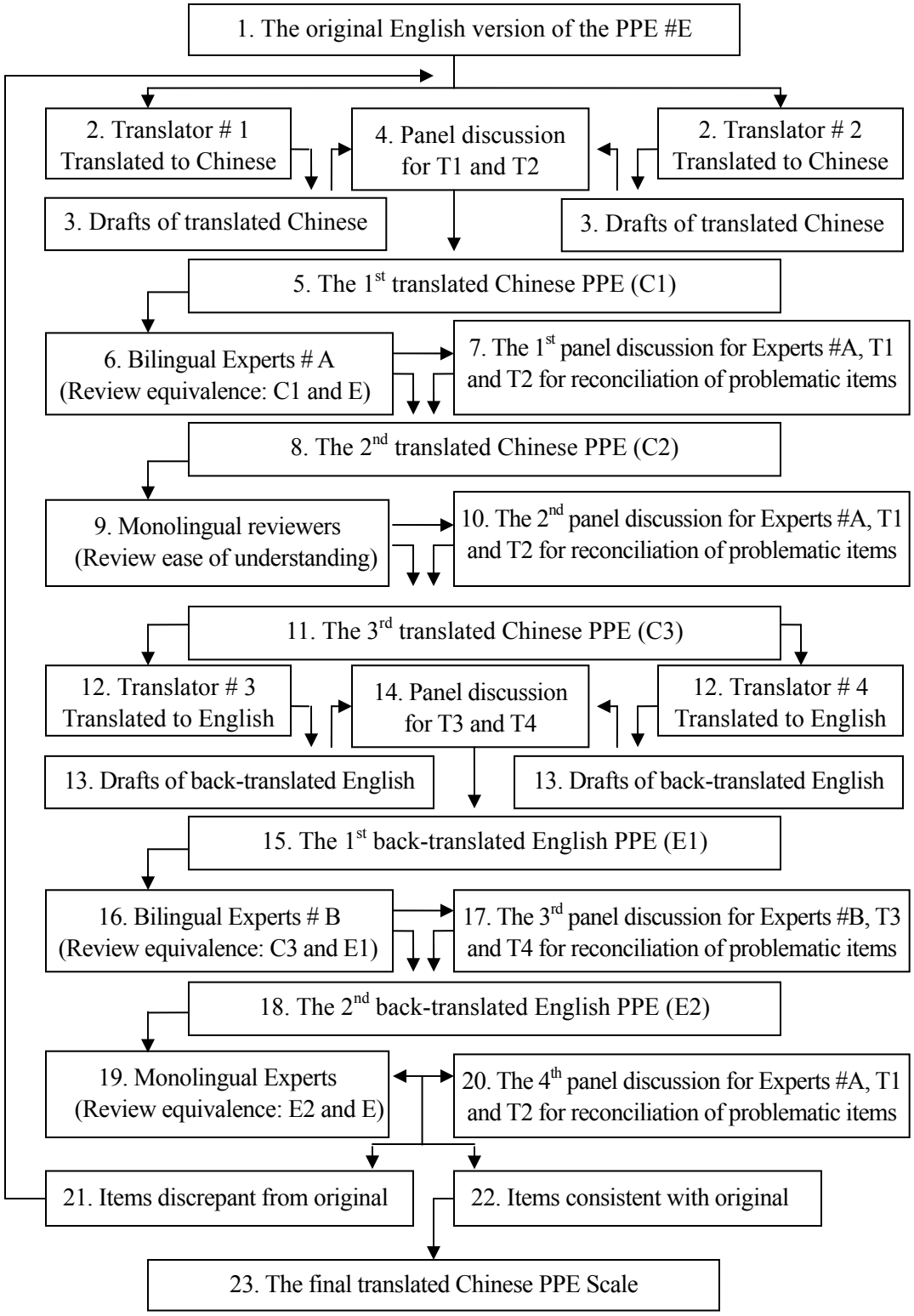

Figure 5. Development of the Translated-Adapted Chinese PPE Scale

The procedure for each translation step is elaborated below:

1. Step 1 to 2: The forward translation was performed first. During these steps, two bilingual and bicultural translators independently translated the original PPE Scale from English into Chinese. Prior to the actual forward translation, the two translators received a set of guidelines for the translation in an effort to achieve optimal accuracy in translation. First, the development and the whole meaning of the text about the original English version of the PPE Scale was introduced to allow the forward translators to better understand the context within which the tool was developed, prior to their translation. Second, the source language was presented on translation sheets in a clear, simple and comprehensive format for the translators to facilitate the completeness of translation. Third, the translator was instructed to focus on the meaning of the text rather than word-by-word or phrase-for-phrase translation which is emphasized in this study. The translators were also asked to present the translated text by using words that best convey the intent of the text (Chaiyawat & Brown, 2000), are part of everyday-spoken language (Baldacchino, Bowman, Buhagiar, 2002) and are easily understandable (Dela Cruz, Padilla, & Agustin, 2000).

Because blind back translation is highly recommended for establishing translation equivalence (Brisline, 1970), the translators were also asked to work independently to reduce the risk of sharing misconceptions or compromising

each other (Maneesriwongul & Dixon, 2004). Aside from the information just described, the translators worked independently without further additional instructions until the forward translation is completed. The translators were strongly encouraged to complete the translation process even if they encountered difficulties in translating some word or paragraph from English to Chinese. The translators were asked to document any difficulties in translation and identify the reason why they determined the translation in the comment area of the translation sheets.

2. Step 3: The two translators were asked to submit their independent translation works to the researcher when the translation was completely accomplished. The researcher preliminary examined any unclear or incomplete translation and separately discussed the results with the translators, making revisions as needed on their individual draft of the translated Chinese version of the PPE Scale.
3. Step 4 to 5: A discussion among the two translators around items that are unclear, incorrect, and different translations can be used to establish a truer meaning of the translation (Chaiyawat & Brown, 2000). Therefore, the researcher reorganized the two drafts together into one sheet and passed on to the two translators. The two translators were asked to review each of the translated items and chose the one that best conveys the meaning of the original English version of the PPE Scale. Several rounds of panel discussions were performed to achieve reconciliation of the translation and consensus on the first

translated Chinese version of the PPE Scale was obtained. Considering the time constraints and the risk of bias including sharing misconceptions or compromising each other through the direct interaction between the two translators, the researcher used e-mail with an anonymous method rather than conduct a conference meeting for a panel discussion in order to solve discrepancies in translation and obtain a consensus version for the forward translation. The researcher organized the two translators' opinions on items with different translations and served as a third party to pass the information using e-mail to the two translators for further discussion and revisions to limit the interaction between translators. The two translators were strongly encouraged to give suggestions for revisions or describe reasons to support their translation work as needed and then e-mail their opinions to items with different translations to the researcher. The cyclic sequence of providing feedback and revisions was repeatedly performed until a final consensus on the first translated Chinese version of the PPE Scale was obtained.

4. Step 6: It is recommended that the quality of translation can be evaluated by a panel of bilingual experts (Tang & Dixon, 2002) or by a discussion among translators (McDermott & Palchanes, 1994). Therefore, a translation committee called forward translation committee was set up in this step to evaluate and reach semantic equivalence of the translated Chinese version of the PPE Scale. This translation committee was composed of seven bilinguals including the five

bilingual experts in Panel A and the two translators originally performing the forward translation. In order to encourage the five bilingual experts to freely suggest revisions and prevent any judgment bias derived from the interaction between translators and experts, the researcher initially gave the first translated Chinese version of the PPE Scale and the original English version of the PPE Scale to the five bilingual experts in Panel A for evaluating the translation equivalence. The five bilingual experts in Panel A were asked to use the original English version of the PPE Scale as source language. These five bilingual experts were asked to independently judge and rate the equivalence between the two versions. In addition, these experts were also strongly encouraged to provide suggestions for revision as needed. These five experts were asked to independently pass on the results of their decisions to the researcher. When the researcher received the results from the experts, the researcher first examined the results and identified any unclear comments or incomplete judgments and separately discussed these results with the experts to obtain a consensus on making revisions on their individual results as needed.

5. Step 7 to 8: After receiving the five translation equivalence results from the experts, the researcher computed the Translation Validity Index (TVI) using the method proposed by Tang and Dixon (2002). The unsatisfactory item with TVI less than 80% agreement on assessments rated on score 4 were organized together for further revision. The problematic items were passed on to the

original translators. The two translators who originally performed the forward translation were encouraged to defend their translation or make revision according to the experts' suggestions. The feedback from these two translators was then passed on to the five experts in Panel A for re-evaluation of translation equivalence.

The cyclic sequence of expert judgment-analysis-translator feedback-expert judgment was repeated until that TVI at 80% agreement on assessments rated on score 4 and 100% of assessments rated on score 3 or 4 for the entire instrument achieved to produce a second translated Chinese PPE Scale with consensus from the translation committee (Tang & Dixon, 2002). With potential time constraints, the diverse geographic locations of members on the forward translation committee, and the risk of bias such as sharing misconceptions or compromising each other through the direct interaction between members, the researcher served as a third party to pass the information using e-mail to the members on the forward translation committee to construct panel discussions for the translation committee to come to group consensus on problematic items (Beck, Bernal, Froman, 2003).

6. Step 9: In order to assess how accurately the connotative meaning was captured in the translated Chinese version of the PPE Scale, the researcher pretest the translated contents with five monolingual reviewers (Drasgow, & Hulin, 1987). A group of five Taiwanese nurses working in acute care settings outside the

studied hospital were asked to serve as monolingual reviewer to independently evaluate and rate the understandability, clarity, and readability of the second translated Chinese version of the PPE Scale. Moreover, in order to ensure that the translated Chinese version of the PPE Scale was understood as being a meaningful equivalent to items on the original English PPE Scale, a probe technique was utilized in this study (Guillemin, Bombardier, & Beaton, 1993). To accomplish this, the five monolingual reviewers were asked to read each item and briefly described their thoughts about what the item intends to ask for. After the researcher received the feedbacks from the five monolingual reviewers, the researcher first examined the results for any unclear comments or incomplete judgment and separately discuss with the reviewers to obtain a consensus on making revisions on their individual feedback results as needed.

7. Step 10: After the five monolingual reviewers' feedback was completed, the researcher adopted Lynn's (1986) method of computing Content Validity Index (1986) to estimate the understandability, clarity, and readability of the second translated Chinese version of the PPE Scale. Based on monolingual reviewers' comments and rating results, minor modification of the instrument was made (Beck et al., 2003). Items with understandability, clarity, or readability scores less than 80% agreement on assessments rated on score 4 along with items misinterpreted by the monolingual reviewers were then organized together and passed on to the seven members of the previous translation committee for

reconciliation of problematic items through panel discussions. The cyclic sequence of monolingual judgment-analysis- translation committee feedback-monolingual judgment was repeated until the consensus on the third translated Chinese version of the PPE Scale was obtained. The third translated Chinese version of the PPE Scale was produced when the understandability, clarity, and readability of the entire instrument achieved at least 80% agreement on assessments rated on score 4 and 100% agreement on assessments rated on score 3 or 4 (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang and Dixon, 2002).

8. Step 11 to 12: The back translation began after the consensus in the third translated Chinese version of the PPE Scale was obtained. Additionally, two new bilingual and bicultural translators paired as the member of the back translation group independently back-translated the third translated Chinese version of the PPE Scale into English.

    Similar to what occurred in step 1 to 2, prior to the actual back translation, the two new translators received a set of guidelines for back-translation. They received the Backward Translation Sheets which contained a brief explanation of the PPE Scale, recommendations regarding wordings for the translation process, and directions of documenting translation. Aside from providing the information cited above, these two new translators were also asked to work independently without further additional instructions, until the back translation

was fully completed. The new translators were asked to use the translated Chinese version of the PPE Scale as source language for translation without trying to inference its original English structures. The translators were strongly encourage to complete the translation process even if they encountered difficulties in translating some word or paragraph from Chinese to English. They were asked to document any difficulties in translation and identify the reason why they determined the translation in the comment area of the translation sheets.

9. Step 13: The two new translators were asked to submit their independent translation work to the researcher when the translation was completely accomplished. The researcher first examined any unclear or incomplete translation and separately discussed with the translators what revision was needed to obtain the consensus on their drafts of the back-translated English version of the PPE Scale.
10. Step 14 to 15: The researcher reorganized the two drafts together into one sheet and passed it on to the two translators in charge of back translation. The two translators were asked to review each of the translated items and chose the one that best conveys the meaning of the original English version of the PPE Scale. Several rounds of panel discussions were performed to reconcile the translation and achieve consensus on the first back-translated English version of the PPE Scale. With the same concerns as mentioned in step 4 to 5, the researcher used

e-mail with an anonymous method instead of a conference for panel discussion to solve discrepancies in translation and to obtain a consensus version for the back translation. The researcher organized the two translators' opinions on items with different translations and served as a third party to pass the information using e-mail to the two translators for further discussion and revisions to limit the interaction between translators. The two translators were strongly encouraged to give suggestions for revisions or described reasons to support their translation work as needed and then e-mail their opinions to items with different translations to the researcher. The cyclic sequence of providing feedback and revisions was performed repeatedly until a final consensus on the first back-translated English version of the PPE Scale was reached.

11. Step 16: A new translation committee composed of seven members was conducted to evaluate and help reach semantic equivalence between the back-translated English version of the PPE Scale and the third translated Chinese version of the PPE Scale. This new translation committee called back translation committee included five bilingual experts in Panel B and the two translators in charge of the back translation. Procedures similar to those performed in step 6 occurred. The researcher first gave the first back-translated English version of the PPE Scale along with the final translated Chinese version of the PPE Scale to the five bilingual experts in Panel B for evaluating the translation equivalence. This approach allowed the five bilingual experts in

Panel B freely suggested revisions and prevented any judgment bias derived from the interaction between translators.

The five bilingual experts in Panel B were asked to use the final translated Chinese version of the PPE Scale as source language. These five bilingual experts were asked to independently judge and rate the equivalence between the two versions and to made suggestions for revision as needed. The five experts were asked to independently submit their evaluation results to the researcher. The researcher then examined any unclear comments or incomplete judgment and separately discussed them with the experts to obtain a consensus on making revisions on their individual results as needed.

12. Step 17 to 18: After the five translation equivalence results from the bilingual experts in Panel B were completely obtained, the researcher computed the Translation Validity Index (TVI) using the method proposed by Tang and Dixon (2002). Items with TVI score of less than 80% agreement on assessments rated on score 4 were organized together for further revision. The problematic items were passed on to the original translators who completed back translation. These two translators were encouraged to defend their translation or make revisions according to the experts' suggestions. The feedback from the two translators was then given to the five experts in Panel B for re-evaluation of translation equivalence. The cyclic sequence of expert judgment-analysis-translator feedback-expert judgment was repeated until a desired higher standard for

translation equivalence was achieved. The second back-translated English version of the PPE Scale with consensus from the seven members of the translation committee was not obtained until TVI score achieved 80% agreement on assessments rated on score 4 for every items and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Tang & Dixon, 2002). With the similar concerns in step 7 to 8, an e-mail with an anonymous method was applied to construct panel discussions for the translation committee to come to group consensus on problematic items (Beck, Bernal, Froman, 2003). The researcher served as a third party to pass the information using e-mail to the members on the back translation committee instead of setting up a conference for the back translation committee.

13. Step 19: In order to assess how accurately the connotative meaning of the original PPE Scale items had been maintained through forward translation and back translation; the researcher gave the second back-translated English version of the PPE Scale and the original English version of the PPE Scale to three monolingual experts who developed the original English version of the PPE Scale for evaluating the translation equivalence. The three monolingual experts were asked to use the original English version of the PPE Scale as source language to compare the translation equivalence between the two versions. These three monolingual experts were asked to independently evaluate and rate the translation equivalence of the second back-translated English version of the

PPE Scale as compared to the original PPE Scale. These reviewers were also be asked to document any problem with regard to the concepts, definitions, and items on the revised back-translated English version of the PPE Scale, that were different from the original English version of the PPE Scale and lead to differences in meaning.

14. Step 20: After the researcher received the feedbacks from the three Monolingual experts, the researcher used method proposed by Tang and Dixon (2002) to compute the Translation Validity Index (TVI) of the instrument. Based on monolingual experts' rating results, satisfactory items with a TVI score greater than 80% agreement on assessments rated on score 4 were recruited in the final version of the back-translated English PPE Scale. Their contents in the third translated Chinese PPE Scale were recruited in the final translated Chinese version of the PPE Scale. In contrast, items with a TVI score less than 80% agreement on assessments rated on score 4 were organized together and sent to the seven members of the back translation committee composed of the five bilingual experts in Panel B and the two translators in charge of back translation to reexamine the problems of discrepancies and decide if the problems were resulted from the back translation or not. Again, all the revisions were given to the three monolingual experts for re-evaluating the equivalence. When problematic items on the draft of the back-translated English PPE Scale were identified not derived from incorrect back translation process, their initial

contents in the original English version of the PPE Scale were signed out for proceeding in repetition of forward-back translation, which was accomplished through steps 1 to 20, until translation equivalence was obtained.

The translation procedures described above was assumed to be completely accomplished when the final translated Chinese version of the PPE Scale and the final back-translated English version of the PPE Scales were successfully produced through the thorough translation steps.

Empirical Test of Translation Equivalence

After went through the repetition of steps 1 to 20 and no discrepancy in any of the items in the original English version of the PPE scale achieved, the translation equivalence was empirically validated through pre-testing the original English version of the PPE Scale along with the final translated Chinese version of the PPE Scale with 35 bilingual participants; and pre-testing the original English version of the PPE Scale along with the final back-translated English version of the PPE Scale with 10 monolingual participants (See Figure 6).

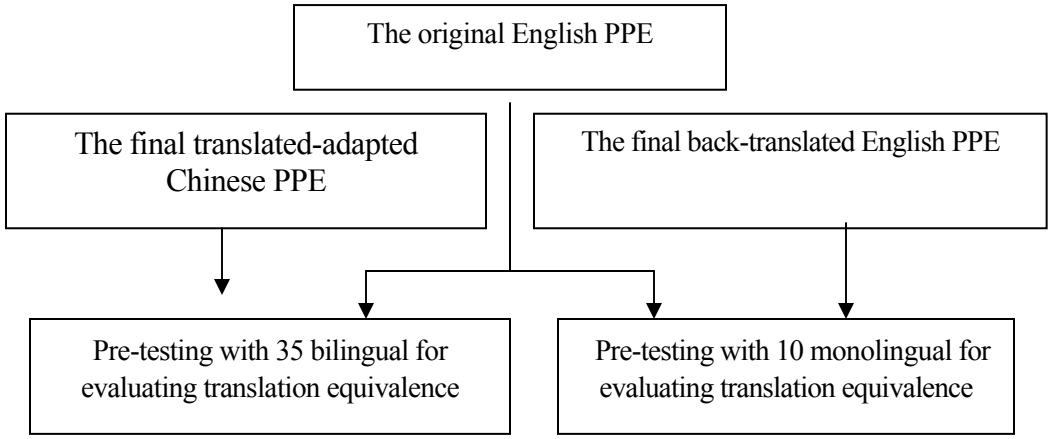

Figure 6. Translation Equivalence Test Procedures

Data Collection

When permissions from the developer of the PPE Scale at MGH and the approval of the Institutional Review Board of Boston College were obtained, the researcher gave the Forward Translation Sheets to the two translators in charge of forward translation to collect the translation results. After the consensus on the drafts of the translated Chinese version of the PPE Scale was obtained from the two translators, the Translation Equivalence Questionnaire for Original English and Translated Chinese Versions of the PPE Scale was distributed to the five bilingual experts in Panel A to obtain the translation equivalence between the original English version of the PPE Scale and the translated Chinese version of the PPE Scale. After reconciling problematic items from the above translation committee was completed, the Monolingual Reviewer Questionnaire for the Translated Chinese Version of the PPE Scale was distributed to the five monolingual reviewers for evaluating the understandability, clarity, and the readability of the second translated Chinese version of the PPE Scale. When the final translated Chinese version of the PPE Scale was produced through reconciliation of problematic items from the forward translation committee, the Backward Translation Sheets B was distributed to two new translators in charge of back translation for documenting the results from back-translating the third translated Chinese version of the PPE Scale into English.

Similar to the above procedures, after the consensus on the drafts of the back-translated English version of the PPE Scale was obtained from the two translators in charge of back translation, the Translation Equivalence Questionnaire for Translated

Chinese and Back-Translated English Versions of the PPE Scale was distributed to the five bilingual experts in Panel B for evaluating the translation equivalence between the translated Chinese version of the PPE Scale and the back-translated English version of the PPE Scale. Then, after the reconciliation of problematic items of the back-translated English version of the PPE Scale from the back translation committee was completed, the Translation Equivalence Questionnaire for Original English and Back-Translated English Versions of the PPE Scale was distributed to three monolingual experts for collecting experts' opinions about the translation equivalence between the original English version of the PPE Scale and the back-translated English version of the PPE Scale. When the forward and back translations were accomplished with satisfactory translation equivalence derived from experts' opinions, the original English version of the PPE and the Translated Chinese Version of the PPE Scale was distributed to 35 bilingual participants at the same time to empirically test the translation equivalence between the two versions. Meanwhile, the Back-Translated English Version of the PPE Scale and the original English version of the PPE Scale were used to empirically test the translation equivalence between the two versions with 10 monolingual participants in a 7-day interval. The order of filling out the instruments was randomly determined by flipping a coin, so the monolingual participants first filled the original English version of the PPE Scale and seven days latter filled the Back-Translated English Version of the PPE Scale.

Data Analysis

Data analyses for Phase I was performed using Statistic Package for the Social

Science (SPSS), Version 15.0. Descriptive statistics including mean, mod, and frequency; correlation coefficient and paired t-test were utilized in this stage to describe and test the translation equivalence.

During the instrument translation stage in Phase I, relevant statistical analyses were performed to answer the Research question 1: To what extent can the equivalence of the translated-adapted Chinese version of the PPE Scale as relative to the English version of the PPE Scale be demonstrated through the use of translation and adaptation techniques? The first research hypothesis, ″the translated-adapted Chinese version of the PPE Scale demonstrates semantic, content, and conceptual equivalence as relative to the English version of the PPE Scale″, was tested to answer the Research question 1. To test the first research hypothesis described, different statistical analyses focused on evaluating the semantic equivalence of the translated Chinese version of the PPE Scale were performed in Stage I, instrument translation. In fact, the evaluation of semantic equivalence was performed at two timings: (a) the process of translation and (b) the end of translation. These analyses will be elaborated in the following pages.

To evaluate the semantic equivalence during the translation process, three kinds of evaluations were established. First, TVI scores were computed using the method proposed by Tang and Dixon (2002) to determine the semantic equivalence in translation. The TVI scores for the original English version of the PPE Scale and the translated Chinese version of the PPE Scale, for the translated Chinese version of the PPE Scale and the back-translated English version of the PPE Scale, and for the original English version

of the PPE Scale and the back-translated English version of the PPE Scale were separately calculated. According to Tang and Dixon (2002), translation equivalence was determined by that TVI score achieves 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument.

Second, the indices of understandability, clarity, and readability were computed by adopting Lynn's (1986) method of computing the Content Validity Index (1986). The proportion of experts who rate each item on a score of 3 or 4 was calculated for the indices of understandability, clarity, and readability for every item. The indices of understandability, clarity, and readability for the total instrument were computed by summing the percentage agreement scores of the items that were given a rating of ″3″or ″4″by the experts. The understandability, clarity, and readability of the instrument in this study was determined by that UI, CI, and RI scores achieved 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang and Dixon, 2002).

Third, the comments on the intention of items reported by the five monolingual reviewers were judged by the researcher to determine the translation equivalence in terms of semantic equivalence. The semantic equivalence achieved when the item intention score achieves 80% agreement on assessments rated on score 1 (correct) for every item and for total scale (Waltz, Strickland and Lenz (1991).

At the end of translation, in which the translation procedures were accomplished to produce the final translated Chinese version of the PPE Scale and the final back-translated English version of the PPE Scale, the semantic equivalence of the translated Chinese version of the PPE Scale was empirically tested with monolingual and bilingual participants. This occurred in two steps.

First, using data gathered from 35 bilingual participants' responses on the original English version of the PPE Scale and on the final translated Chinese version of the PPE Scale, the percentage of consistency, Paired t-test, Pearson correlation coefficient, and Intra-classCorrelation Coefficients (ICC) were computed for each of the paired items to test the semantic equivalence between the original English version of the PPE Scale and the final translated Chinese version of the PPE Scale.

Second, using data gathered from 10 monolingual participants' responses on the original English version of the PPE Scale and on the back-translated English version of the PPE Scale, the percentage of consistency, Paired t-test, Pearson correlation coefficient, and Intra-classCorrelation Coefficients (ICC) were computed for each of the paired items to test the semantic equivalence between the original English version of the PPE Scale and the back-translated English version of the PPE Scale.

Stage II Instrument Validation and Adaptation

Instrumentation

Three forms were utilized during Stage II, Instrument Validation and Adaptation. These forms are elaborated below:

1. *Content validity questionnaire of the Chinese Version of the PPE Scale for Taiwanese experts.* This instrument was developed by the researcher to allow the Taiwanese Experts who were invited to validate the contents of the final version of the translated Chinese PPE Scale with the consideration of cultural sensitivity (see Appendix J). The Content validity questionnaire of the Chinese Version of the PPE Scale for Taiwanese experts contained a cover letter, review guide and content validity questionnaires. The cover letter described the purpose of the study, importance of validating the instrument, required concerns for evaluation and contributions. The review guide described the criteria and the definitions of the five domains for validating the instrument, which included the relevance, representativeness, clarity, readability, and comprehensiveness. The content validity questionnaire included the directions for evaluating the items. Each of the items in the content validity questionnaires was placed under its relevant concept domain with a 4-point Likert scale for Taiwanese experts' responses to the relevance, representativeness, clarity, and readability of the items, and the comprehensiveness of the items and concepts. The 4-point Likert scale for evaluating the relevance was defined as follows: 1 = item is not relevant to the concept; 2 = item is somewhat relevant to the concept; 3 = item is quite relevant to the concept; and 4 = item is very relevant to the concept. The 4-point Likert scale for evaluating representativeness was defined as follows: 1 = item is not representative of the concept; 2 = item needs major revision to be representative of the concept; 3 = item needs minor revision be representative of the concept; and 4 = item is representative of the concept. The 4-point

Likert scale for evaluating clarity was defined as follows: 1 = item is not well written; 2 = item needs major revision; 3 = item needs minor revision; and 4 = item is well written. The 4-point Likert scale for evaluating readability was defined as follows: 1 = item is not easy to read; 2 = item needs major revision to be easy to read; 3 = item needs minor revision to be easy to read; and 4 = item is easy to read. The 4-point Likert scale for evaluating the items comprehensiveness was defined as follows: 1 = item are not enough to completely present the concept; 2 = major item needs to be added to completely present the concept; 3 = minor item needs to be added to completely present the concept; and 4 = item are enough to completely present the concept is representative of the concept. The 4-point Likert scale for evaluating the concepts comprehensiveness was defined as follows: 1 = concept are not enough to completely present the concept; 2 = major concept needs to be added to completely present the concept; 3 = minor concept needs to be added to completely present the concept; and 4 = concept are enough to completely present the concept is representative of the concept.

In the end of every concept domain and the entire questionnaire, a comment area was provided for experts to suggest revisions for any item with rating score below 4 and add items or concepts for enrich the comprehensiveness of the instrument. The scoring method of this instrument adopted Lynn's (1986) method of computing Content Validity Index (1986) for estimating the relevance, representativeness, clarity, readability, and comprehensiveness of the final version of the translated Chinese PPE Scale. The index of relevance, representativeness, clarity, readability, and comprehensiveness for every item

was computed by calculating the proportion of experts who rate on score 3 or 4. The index of relevance, representativeness, clarity, readability, and comprehensiveness for total instrument was computed by summing the percentage agreement scores of the items that are given a rating of ″3 or 4″by the experts. In this study, the satisfactory value for index of relevance, representativeness, clarity, readability, and comprehensiveness was determined by that at least 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang and Dixon, 2002).

2. Content validity questionnaire of the Chinese Version of the PPE Scale for focus group. The researcher developed this instrument for reviewers who were recruited from Taiwanese clinical leaders to validate the contents of the final version of the translated Chinese PPE Scale with the consideration of cultural sensitivity (see Appendix K). The Content Validity Questionnaire of the Translated Chinese Version of the PPE Scale for Focus Group included a cover letter, review guide and content validity questionnaires. Most of the contents and formats in this instrument were similar to the Content validity questionnaire of the translated Chinese Version of the PPE Scale for Taiwanese Experts except to the cover letter in which the focus group was used to replace the Taiwanese experts. Each of the items in the content validity questionnaires was also placed under its relevant concept domain with a 4-point Likert scale for focus group members to respond to the relevance, representativeness, clarity, and readability of the items, and the comprehensiveness of the items and concepts. The definitions for 4-point

Likert scale for evaluating the relevance, representativeness, clarity, readability, and comprehensiveness; and the scoring method and the evaluation criteria were as the same as those in the Content validity questionnaire of the translated Chinese Version of the PPE Scale for Taiwanese Experts. The index of relevance, representativeness, clarity, readability, and comprehensiveness for every item was computed by calculating the proportion of experts who rate on score 3 or 4. The index of relevance, representativeness, clarity, readability, and comprehensiveness for total instrument was also computed by summing the percentage agreement scores of the items that are given a rating of ″3 or 4″by the experts. The satisfactory value for index of relevance, representativeness, clarity, readability, and comprehensiveness was also determined by that at least 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang and Dixon, 2002).

3. Face validity questionnaire of the Chinese Version of the PPE Scale. The researcher developed this instrument (see Appendix L) for monolingual reviewers whose mother language is Chinese Mandarin to evaluate the understandability, clarity, and readability of the items in the Adapted Chinese Version of the PPE Scale adapted. This instrument contained a cover letter, a review guide, 66-item Chinese Version of the PPE Scale and the validity evaluation questionnaires. The purpose of the study, importance of evaluating the contents of the culturally adapted instrument, required concerns for evaluation and contributions of the evaluation of face validity were described in the cover

letter. The criteria for evaluation and the way to complete the reviewer questionnaires were described in the review guide. Each of the 66 items on the Chinese Version of the PPE Scale was placed on 4-point Liker scales of 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree) for monolingual reviewers' responses. The validity evaluation questionnaires included the directions for evaluating the items. Each of the evaluated items was placed in three 4-point Liker scales for monolingual reviewers' responses to the understandability, clarity, and readability of the Scale. The 4-point Likert scales for evaluating understandability was defined as follows: 1 = item is not easily understood; 2 = item needs major revision to be easily understood; 3 = item needs minor revision be easily understood; and 4 = item is easily understood. The 4-point Likert scales for evaluating clarity was defined as follows: 1 = item is not well written; 2 = item needs major revision; 3 = item needs minor revision; and 4 = item is well written. The 4-point Likert scales for evaluating readability was defined as follows: 1 = item is not easy to read; 2 = item needs major revision to be easy to read; 3 = item needs minor revision to be easy to read; and 4 = item is easy to read. Comment area was provided to allow the monolingual reviewers to suggest revisions for items with rating scores less than 3. The scoring method of this instrument adopted Lynn's (1986) method of computing Content Validity Index (1986) for estimating the understandability, clarity, and readability of the evaluated items. The Understandability Index (UI), Clarity Index (CI), and Readability (RI) score for every item were determined by the proportion of experts who rate items on score 3 or 4. UI, CI, and RI of the total instrument were computed by summing the

percentage agreement scores of the items that are given a rating of ″3 or 4″by the experts. The desirable higher standard value for UI, CI, and RI scores in this study was determined by that at least 80% agreement on assessments rated on score 4 for every items and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang and Dixon, 2002).

Sampling

Three different sampling procedures were performed in Stage II, Instrument Validation and Adaptation. These sampling methods are elaborated below:

1. The Recruitment of content validators. In order to ensure the adequacy with which relevant content has been sampled and the adequacy with which this content has been reflected in the instrument (Nunnally & Bernstein, 1994), the researcher recruited the following two groups of participants to serve as content validators to judge the relevance, representativeness, clarity, readability, and comprehensiveness of the instrument:

(1) The recruitment of content validity experts: A panel of 10 Taiwanese experts, who matched the inclusion criteria, was recruited in the study to serve as content validators. The qualifications of content experts matched one of the following criteria: (a) having expertise in clinical nursing administration, (b) having research experiences concerning nursing administration, and (c) having expertise in teaching nursing administration.

Panel members were purposely recruited into this study because they

were known to have expertise in nursing administration and were familiar with nursing practice environments in Taiwan. The ten recruited Taiwanese experts were female. Five experts were doctorally prepared in nursing and others were master's degree-prepared in nursing. One doctorally prepared expert was active a dean of a nursing school and a President of a nursing association. Two doctorally prepared experts were active Director of Nursing Department in public teaching hospitals. One doctorally prepared expert was active Associate Director of Nursing Department in a public teaching hospital. One doctorally prepared expert was active Associate Professor of Nursing Department and Supervisor of Nursing Department in a public teaching hospital. Four master's degree-prepared experts were active Director of nursing department in private teaching hospitals.One master's degree-prepared expert with the experience of serving as associate director of nursing department was active Chief Secretary of a nursing school.

(2) The recruitment of focus group: A panel of five Taiwanese nurses, who matched the inclusion criteria, was recruited in the focus group to serve as content validators. The qualifications of focus group members matched all the following criteria: (a) being a nurse leader (head nurse or supervisors) working in acute care setting in Taiwan, and (b) willing to take apart in this study.

The five recruited Taiwanese nurses were female and active head nurses

in a private teaching hospital. They had an average of 17.4 years of working as registered nurses. Four nurses held a Bachelor's degree in Nursing and one nurse completed her Master's degree in Nursing. These five head nurses were familiar the nursing practice environment in medical-surgical wards, intensive care units, and emergency room.

2. The recruitment of prospective participants for pre-testing the adapted Chinese version of the PPE Scale. In order to determine whether items were clear and could reflect the intended meaning of the items, the researcher used a snowball method to recruit a convenient sample of five Taiwanese nurses resembling the target language population from outside the studied hospital to review the draft contents of the adapted Chinese version of the PPE Scale (Tran & Aroian, 2000). Participants were encouraged to introduce any other potential participants who matched the inclusion criterion to the researcher. The researcher then contacted the potential participants for further recruitment. The inclusion criteria were as follows: (a) a nurse working in acute care settings in Taiwan, and (b) willing to take apart in the study.

The five recruited Taiwanese nurses were female staff nurses in a teaching hospital. These nurses aged from 26 to 34 years (mean age=30.8 years) and had an average of 3.6 years of working as registered nurses. Three nurses owned a Bachelor degree in nursing. Two nurses owned a diploma in nursing.

Validation and Adaptation Procedure

Adaptation refers to the process of developing a measurement instrument across

languages. In addition to simply translating an instrument, adaptations to reflect a culture, in content and in wording are needed for cross cultural research (Geisinger, 1994). Though back translation may uncover any important differences in meaning between the original version of the instrument and its translation (Behling & Law, 2000), direct and back translation only guarantees a linguistic equivalence not the cultural equivalence of the instrument (Kristjansson, Desrochers, & Zumbo, 2003). Therefore, it is critical for the researchers to check the validity and usefulness of the instrument when the instrument is used with a population that differs from the original one for instrument development (Geisinger, 1994). Prior to actually administrating the translated Chinese version of the PPE Scale to a large sample to test psychometric properties, the translated Chinese version of the PPE Scale was inspected for its content validity and culturally adapted as needed to ensure that the culturally relevant contents has been sampled in the translated Chinese version of the PPE Scale and the contents of the translated Chinese version of the PPE Scale were useful to be utilized in measuring Taiwanese nurses' professional practice environments. As demonstrated in Figure 7, the approaches for validation and cultural adaptation weres adopted from several researchers (Beck, & Gable, 2001; Dela Cruz, Padilla, & Agustin, 2000; Geisinger, 1994; Guillemin, Bombardier, & Beaton, 1993; Kristjansson, et al, 2003).

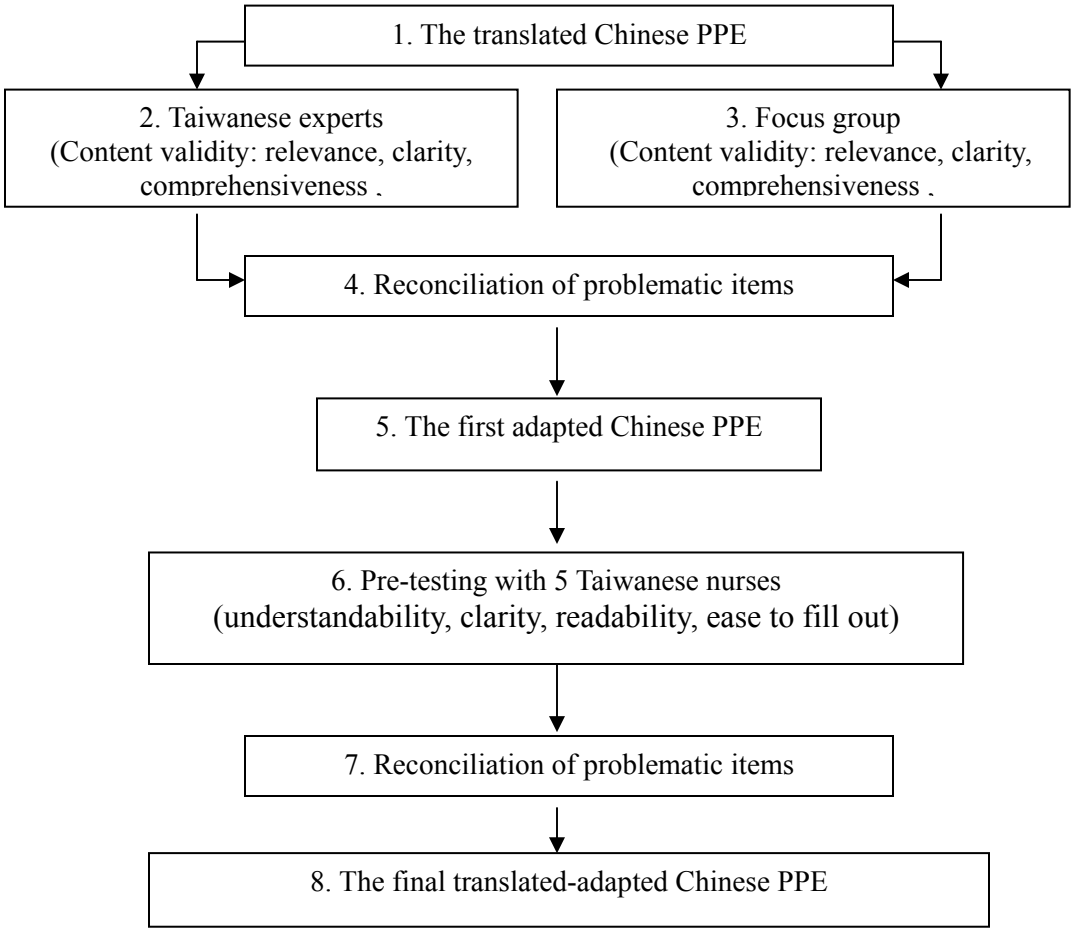

Figure 7. Validation and Cultural Adaptation Procedures of the PPE Scale

Content validity is determined by the adequacy with which relevant content has been sampled and the adequacy with which this content has been reflected in the instrument (Nunnally & Bernstein, 1994). The content of the instrument is a critical aspect of validity testing and should be ensured before the actual test is conducted (Nunnally & Bernstein, 1994). To validate the translated Chinese version of the PPE Scale, this study recruited 15 Taiwanese experts serving as content validators to judge and rate the relevance, representativeness, clarity, readability, and comprehensiveness of the instrument. These content validators included ten content experts with professional expertise in nursing administration and a focus group consisted of five head nurses who are familiar with the clinical nursing practice environments and are somewhat knowledgeable in the professional practice environment issue.

First, the 10 content experts were given a brief introduction about the PPE Scale, the Chinese theoretical definitions for the eight dimensions comprising the translated Chinese version of the PPE Scale, items constructed under the dimensions, the special concern for judging the validity, and the method of rating the content validity questionnaires. The 10 content experts were asked to independently judge the content validity for each item and submitted their opinions to the researcher. The content experts were encouraged to add, delete or revise items as needed to ensure the contents of the instrument are useful in measuring Taiwanese nurses' practice environments, or to improve the clarity or readability. When the content validity results from content experts were submitted, the researcher examined any unclear comments or incomplete judgment

and further separately discusses with the reviewers to obtain a consensus and make revisions on their individual feedback. Based on experts and focus group ratings, the researcher adopted Lynn's (1986) method of computing Content Validity Index (1986) to compute the relevance, representativeness, clarity, readability and comprehensiveness of the instrument. Items with any index score less than 80% agreement on assessments rated on score 4 were organized together for further revision and re-validation. E-mail with an anonymous method for a panel discussion was performed to reconcile the problematic items and come to a group consensus (Tang & Dixon, 2002). Several rounds of discussion among the content experts were performed until the consensus on adapting the translated Chinese version of the PPE Scale in reference to culture, in content, or in wording as needed were obtained.

Second, a conference was set up for the five members of the focus group. The focus group discussion mainly worked on validating the contents produced by getting consensus on adapting the translated Chinese version of the PPE Scale from the content experts' opinions. During the focus group discussion, a brief introduction about the PPE Scale, theoretical definitions for each of the dimensions comprising the translated Chinese version of the PPE Scale, items constructed under the dimensions, the special concern for judging the validity, and the method of rating the content validity questionnaires were introduced to every focus group member. The five members of the focus group together discussed and judged the content validity of the draft of the adapted Chinese version of the PPE Scale. By adopting Lynn's (1986) method of computing

Content Validity Index (1986), items with any index score in relevance, representativeness, clarity, readability or comprehensiveness of the instrument less than 80% agreement on assessments rated on score 4 were further discussed in the conference. The focus group members were also encouraged to add, delete or revise items as needed to produce a satisfactory scale for measuring Taiwanese nurses' practice environments.

When the satisfactory translated-adapted Chinese version of the PPE Scale was obtained through several runs of content validation processes, a convenience sample of five Taiwanese nurses was recruited to pre-test the scale. The purposes of pre-testing to scale were to detect problematic items that were unclear or not to reflect the intended meaning of the items, were difficult to be read, or were not easy to be understood; to explore the appropriateness of the scale's format; and to estimate the time consumed in completing the scale. The cyclic sequence of validators feedback- perspective participants' judgments -analysis- validators feedback was repeated until a consensus on the translated-adaptedChinese PPE Scale was obtained.

Data Collection

During this instrument validation and adaptation stage, the Content Validity Questionnaire of the Translated Chinese Version of the PPE Scale for Taiwanese Experts and the Content Validity Questionnaire of the Translated Chinese Version of the PPE Scale for Focus Group were used to collect content validators' opinions about the relevance, representativeness, clarity, readability, and comprehensiveness of the translated Chinese version of the PPE Scale. The Face Validity Questionnaire for the

Adapted Chinese Version of the PPE Scale was distributed to the prospective participants to collect their responses for the clarity, understandability, readability, appropriateness of the format of the instrument; and the average time consumed for filling out the survey.

Data Analyses

Descriptive statistics, including mean, mode, and frequency were utilized in Stage II, instrument validation and adaptation, to describe content equivalence. During this stage, in order to answer the Research question 1, ″to what extent can the equivalence of the translated Chinese version of the PPE Scale as relative to the English version of the PPE Scale be demonstrated through the use of translation techniques?″two major analyses were performed to test first research hypothesis, namely, that the translated Chinese version of the PPE Scale demonstrated semantic, content, and conceptual equivalence as relative to the English version of the PPE Scale.

First, the content validators' ratings prior to reconciliation of problematic items and those following several rounds of panel discussions to reconcile problematic items in the translated Chinese version of the PPE Scale were analyzed. The relevance, representativeness, clarity, and readability and comprehensiveness of the translated Chinese version of the PPE Scale were computed by adopting Lynn's (1986) method of computing Content Validity Index. The index of relevance, representativeness, clarity, and readability and comprehensiveness for every item was computed by calculating the proportion of experts who rated on score 3 or 4. The index of relevance, representativeness, clarity, and readability and comprehensiveness of the total instrument

was computed by summing the percentage agreement scores of the items that were given a rating of ″3 or 4″by the experts. The content equivalence of the translated Chinese version of the PPE Scale was determined by that the Content Validity Index (CVI), in terms of the index of relevance, representativeness, clarity, and readability and comprehensiveness of the translated Chinese version of the PPE Scale achieved 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang and Dixon, 2002).

Second, the face validity of the adapted Chinese version of the PPE Scale was computed. The researcher calculated the index of understandability, clarity, and readability of the adapted Chinese version of the PPE Scale by adopting Lynn's (1986) method of computing Content Validity Index (1986). The index of understandability, clarity, and readability for every item was computed by calculating the proportion of experts who rate on score 3 or 4. The indexes of understandability, clarity, and readability for the total instrument was computed by summing the percentage agreement scores of the items that are given a rating of ″3 or 4″by the perspective participants for pre-testing. The content equivalence of the adapted Chinese version of the PPE Scale was determined by that the Face Validity Index, in terms of the index of understandability, clarity, and readability of the adapted Chinese version of the PPE Scale achieved 80% agreement on assessments rated on score 4 for every item and 100% agreement on assessments rated on score 3 or 4 for the entire instrument (Lynn, 1986; Waltz, Strickland & Lenz, 1991; Tang

and Dixon, 2002).

Phase II Psychometric Evaluation

In Phase II, the psychometric properties of the translated Chinese version of the PPE Scales and the psychometric properties of the adapted Chinese version of the PPE Scale were established and evaluated. In order to provide additional data for assessing psychometric equivalence between the source and the target language versions of the PPE Scale (Jones, 1987), the similarity on reliability and validity between the translated Chinese version of the PPE Scale and the original English version of the PPE Scale were evaluated with a large sample of Taiwanese nurses working in acute care settings (Werner & Campbell, 1970).

Instrumentation

There were two forms utilized for data collection during Phase II:

Chinese Version of the PPE Scale

This instrument was produced after the final translated Chinese Version of the PPE Scale had been validated and cultural adapted. The Chinese Version of the PPE Scale contained a cover letter, review guide, 66-item Chinese version of the PPE Scale, five open-ended questions. The cover letter described the purpose of the study, brief introduction about the PPE Scale, importance of validating the instrument, and participants' critical contributions to this study and nursing. The review guide described the method for completing the scale. The 66-item Chinese version of the PPE Scale included the 38 PPE items, 27 new items suggested by the Taiwanese content validators

and 1 adapted item. The 66 items in the scale were placed on 4-point Likert scales of 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree) for participants' responses. Some open-ended questions with comment area were included in the end of the questionnaires to allow participants to express personal perceptions to current practice environment and issues related to improving and maintaining their practice environment. The Chinese Version of the PPE Scale was administrated to the Taiwanese nurses who were recruited as the target population in this study to compare the psychometric properties between the original English version of the PPE Scale and the translated-adapted Chinese version of the PPE Scale and establish the psychometric properties of the translated-adapted Chinese versions of the PPE Scale.

Demographics Sheets

The demographic sheets were developed by the researcher based on the previous research suggesting a possible correlation with nurses' perceptions of their practice environment, which are the concerns of this study. The demographic sheets collected the basic demographic information of the study sample and their perceptions related to practice environment issues for secondary data analysis. The demographic sheets were used to collect participants' demographic information, wchihc included age, gender, level of education, martial status, current employment status, current education status, years of being a nurse, years of working in the unit, years of working in the hospital, current work position, and salary, and their perceptions about satisfaction, intent to leave and current clinical working conditions.

Sampling and Setting

Two different sampling methods were performed Phase II.

The Recruitment of Prospective Participants for Pilot Test

In order to detect any foreseeable problems that may occur during the formal administration of the instrument, the researcher used a snowball method to recruit a new convenient sample of 10 Taiwanese nurses resembling the target language population from outside studies hospital to construct the pilot test of this study (Tran & Aroian, 2000). The inclusion criteria included: (a) a nurse working in acute care settings in Taiwan, and (b) willing to take apart in the study. The participants were encouraged to introduce any other potential participants who matched the inclusion criterion to the researcher. Then, the researcher contacted the potential participants for further recruitment. The 10 recruited Taiwanese nurses were female staff nurses in a teaching hospital. These nurses aged from 24 to 32 years (mean age=28 years) and had an average of 3 years of working as registered nurses. These nurses all owned a Bachelor degree in nursing.

The Recruitment of Participants for Psychometric Evaluation

The sample size and the representativeness of the sample are critical factors in instrument development (DeVellis, 1991). This study recruited participants from a medical center and 3 regional teaching hospital located in the northern area of Taiwan to test the psychometric properties of the instrument. A non-probability, purposive sampling was used to recruit nurse who work in the study hospitals and matched the inclusion criteria: (1) working as a nurse in the study hospital at least 3 months, and (2) willing to

participate in this study. However, nurses working in outpatient units were excluded because their job descriptions are different from nurses working in acute care settings. Moreover, nurses that were absent due to labor vacation or administration in hospital during the enrollment period were also excluded to limit the impact of the external factors confounding their responses.

Two critical factors were seriously considered to determine the sample size of participants in this study: the number of subjects needed to perform factor analysis and the response rate from a mail survey. The number of items included in the instrument was used to estimate the number of subjects needed in this study to undertake a factor analysis. In order to reduce sampling error, a sample of at least ten subjects per item was planned to be recruited (Nunnally, 1978). Because the final Chinese version of the PPE Scale for psychometric evaluation was composed of 66 items which included 38 PPE items, 27 new items suggested by the Taiwanese content validators and 1 adapted item, the needed number of subjects for the psychometric evaluations of the 66-item Chinese version of the PPE Scale was initially estimated at least 660 (Nunnally, 1978). The response rate to questionnaires estimated as 60 % was also used to adjust the actual number of subjects needed for factor analysis. The sample size needed psychometric evaluation was estimated to be around 1200. This study used over sampling method to recruit 1243 eligible nurses for psychometric evaluation from the 4 study hospitals. Of the 1243 recruited nurses, 993 nurses replied the survey and 977 of the nurses replied a valid questionnaire to the researcher.

In order to evaluate the test-retest reliability of the translated-adapted Chinese versions of

the PPE Scales, the sample size necessary for conducting correlation coefficients was estimated as 50 nurses by assuming a statistic power of .80, an alpha level of .05 and an effect size of .40 (Polit & Hungler, 1999). Using the 60% response rate to questionnaire to adjust the sample size for test-re-test reliability, the number of subjects needed was estimated as 80. This study used over sampling method to recruit 104 eligible nurses for evaluating the test-retest reliability from 5 units randomly selected by the researcher. Of the 104 recruited nurses, 81 nurses replied the survey and 79 of the nurses replied a valid questionnaire to the researcher.

Protection of Human Subjects

The human rights of subjects were carefully protected in this study. This study was approved before the project starts by the Institutional Review Board of Boston College and the Ethic Committee for Human Research and the Institutional Review Board of the study hospital in Taiwan. All participants in this study were voluntary. The researcher mailed the questionnaires to the prospective participants according to the mailing list provided by the study hospitals after the approval from the Institutional Review Board of the study hospitals were obtained.

All participants were given written descriptions of the informed consent which consisted of the title, purpose of study, a description of the subject's participation, the assurances of participant's privacy, anonymity, and confidentiality, the voluntary participation in the study, the participant's right to refuse to give information, withdraw from the study at any time without any consequence, a brief statement of risks and

benefits of participating this study, the procedure of data collection, the time spent for completing questionnaires, the statement of the research study approved by Boston College for human research and Hospital Institutional Review Board, the right to inquiry or clarify study purposes, procedures or specific information regarding to the study at any time, and the way to contact the researcher and the Institutional Review Board of Boston College.

Participant's anonymity and confidentiality was strictly protected by following methods: (1) all questionnaires was anonymous; (2) instead of signing a consent form, replying of completed questionnaires from participants to the research represented presumptive consent to participant this study; (3) participants were asked not to write any names on the questionnaires; (4) respondents were guided to use double envelops with seal to return the questionnaires to researcher; (5) no code number was used to identify or track participants except for those who were selected for evaluating the test-retest reliability of the instruments; (6) participants were asked to return the questionnaire by directly putting in a collection box to eliminate any chance to trace back the respondent; (7) the designed collection boxed for collecting reply questionnaires were kept in a locker room during data collection periods; (8) the issue that no one can open the collection box except the researcher were formally announced by head nurses of the studied units to prevent that collection boxes are accidentally opened by someone else , (9) all the collected questionnaires were kept in a locker cabin that no one is allowed to open it except by the researcher, (10) all the content of completed questionnaires were only read

by the researcher and the advisors of this studies for data analyses; (11) data analyses using department level rather than unit level was performed to reduce the risk that participants are inferred from personal attributes of participants, (12) quantitative data derived from content of completed questionnaires was published as number without any risk of exploration of personal attributes, and (13) qualitative data derived from participant' comments was published by quoting parts of the sentence and using a pseudonym to reduce any risk of exploration of personal attributes.

A code number was included on the questionnaires to identify the subjects selected for evaluating the test-re-test reliability of the instruments in need of the follow-up questionnaires. However, the code number was immediately deleted from each completed questionnaire and substituted by using another non-identifying number when the pre-test and post-test questionnaires were obtained.

Psychometric Evaluation Procedures

The evaluation of the psychometric properties of the translated Chinese version of the PPE Scale and the adapted Chinese version of the PPE Scale was accomplished through two steps. First, five Taiwanese nurses resembling the target language population recruited from a convenience sample form outside the studied hospital received the Tested Chinese version of the PPE Scale. They were instructed to complete the scale and record the time needed to complete the scale. A comment area will be provided to allow them have an opportunity to identify any foreseeable problems that occur during completing the Tested Chinese version of the PPE Scale. Revisions were made to solve

any problems found during pre-testing. Second, after the pre-testing was completed and problems found were solved, the research distributed the Tested Chinese version of the PPE Scale to a large sample of Taiwanese nurses working in acute care setting. The results of nurses' perceptions with their professional practice environment obtained by using the tested Chinese version of the PPE Scale were analyzed to establish and evaluate the psychometric properties of the translated Chinese version of the PPE Scale and the adapted Chinese version of the PPE Scales. The evaluation for psychometric properties included test-retest reliably; factor analysis and internal consistency (see Figure 8).

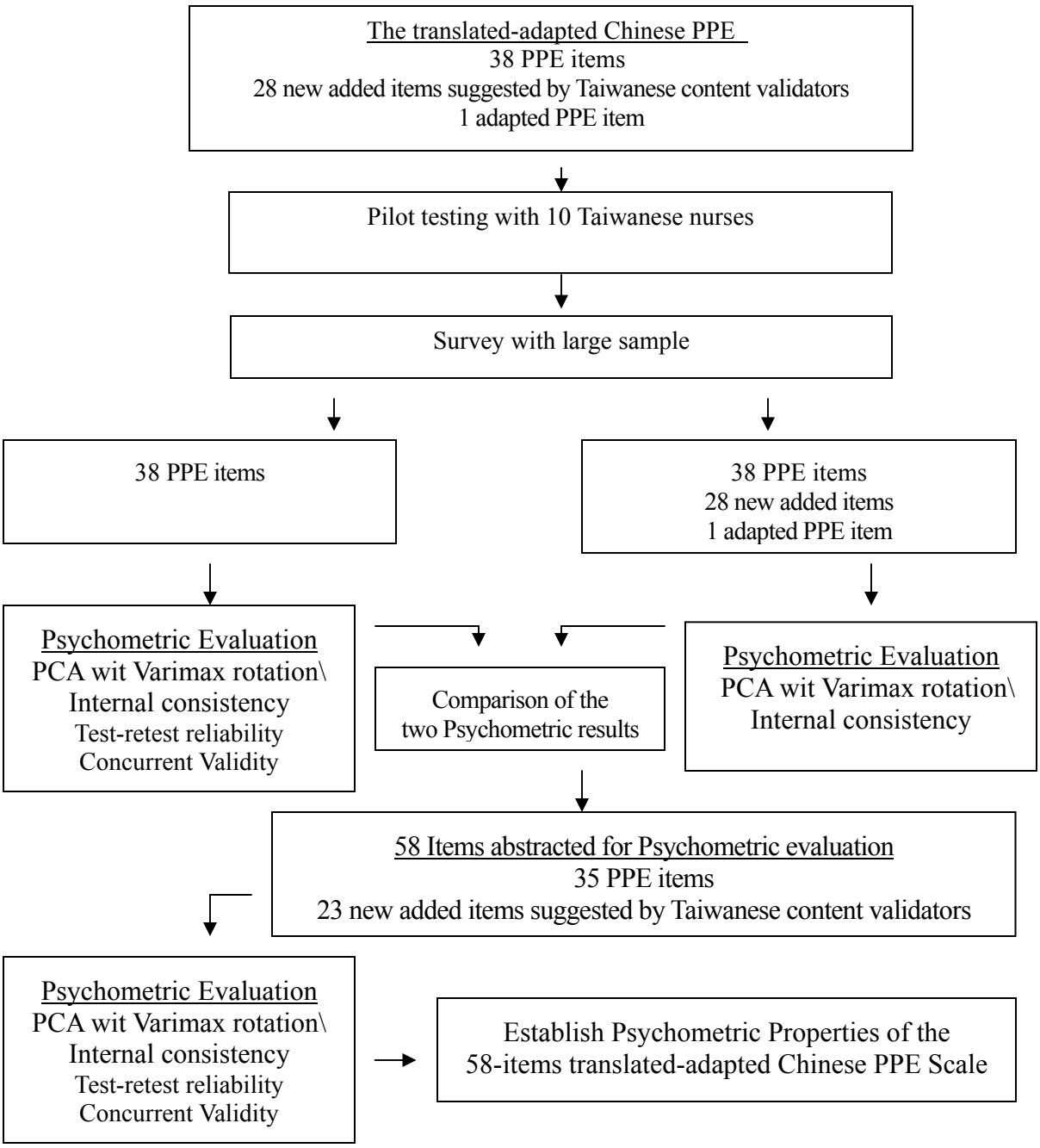

Figure 8. Psychometric Evaluation Procedures

Data Collection

Pre-testing. A form titled the Tested Chinese version of the PPE Scale was distributed to the 10 Taiwanese nurses resembling the target language population recruited from a convenience sample allow the researcher to have an opportunity to identify any foreseeable problems that occur during completing the Tested Chinese version of the PPE Scale.

Psychometric evaluation. According to the policies in the Institutional Review Board of the study hospital in Taiwan, the research proposal and the formal research approval from the Institutional Review Board of Boston College were submitted to the hospital Institutional Review Board after study approved by the Institutional Review Board of Boston College. Oral presentations about the study were conducted in the study hospitals as needed. When applying for approval, the researcher asked the study hospitals to provide a mailing list of prospective participants to increase the accessibility to target the population and assist the researcher to market the approval information of this investigation to their staff nurses. Prior to mailing questionnaires, the researcher randomly drew 5 units from the lists of unit names to serve as units for evaluating the test-re-test reliability of the translated-adapted Chinese versions of the PPE Scale and the adapted Chinese versions of the PPE Scale.

The data collection was administered in 4 hospitals located in the north of Taiwan. After the study approved by the Hospital Institutional Review Board (see Appendix M) and the information of approval had been marketed by the nursing departments of the

study hospitals, all nurses working in the studied hospital directly received a study package (see Appendix N) directly on their unit. The packet consisted of (1) a cover letter from the researcher explaining the purpose of the study and emphasizing that the participation is voluntary and the response is confidential and anonymous; (2) an informed consent from; (3) the demographic information sheets; (4) the Chinese version of the PPE Scale with the guides for self administration and returning the questionnaires to the researcher; (5) two envelops with researcher's name printed on the area of recipient name, and (6) two pens as a present. Specifically, the prospective participants who were selected as the subjects for evaluating the test-re-test reliability of the instruments received another second study package on the unit in a 14-day interval after they reply their pre-test questionnaires to the researcher. The second study package contained all of the same materials used in pre-test period. However, to prevent the risk of recalling memories or feeling bored /inpatient to fill in a same questionnaire twice for the participants, the order of items printed on the Chinese version of the PPE Scale was rearranged in this second package.

Some strategies were utilized to facilitate the success of data collection. First, In order to make sure that the potential participants can successfully receive the study packet, the researcher prepared certain amount of survey packages for each of the units based on the nursing manpower statistic data and organized envelops by unit categories for the study hospitals. Second, the researcher asked each of the study hospitals to help assign a staff to be in charge of administrating the surveys to every unit for this study.

The researcher directly contacted the staff and gave a letter with direction for administrating the surveys to the head nurses. The staff was asked to contact the head nurse of every study unit and give the head nurses the survey packages and the letter with direction for administrating the surveys to the staff. The survey package was directly distributed to participants' work units rather than personal residence. Third, the head nurse on every study unit was asked to announce the information about the approval and the study period of this investigation to nurses. The head nurses was also asked to help distribute the study packet to each of the eligible staff nurses Forth, the data collection method that the participants have been used to in the studied hospitals was applied and modified in this investigation. According to the researcher's previous experience in performing surveys in the studied hospital in Taiwan, most of Taiwanese staff nurses preferred to have a convenient way such as leaving the questionnaire to their head nurse or direct dropping the questionnaire in an assigned collection box located in their unit to return the questionnaire to the researcher. Hence, in order to increase response rate, an opaque collection box was placed in every unit to provide convenient access for participants to return the questionnaire to the researcher and increase the response rate. This investigation guided all participants to put the questionnaires in the double envelops with seal and simply drop the reply envelop into an assigned collection box at their work unit. In addition, in order to protect participants' confidentiality, all collection boxes were sealed by tapes and only a 10*2 cm entrance was left on the top of the box to allow the replied envelops put in and not be taken out through the entrance. Every box was sealed

with a paper with the tile of this study, instruction of not to open the boxes except by the research, and the researcher's name and telephone number for communication. This method could allow peoples understand that only the researcher can open the box in Taiwanese culture, to reduce the risk of being accidentally opened by other people to protect participants' confidentiality. The collection box was put in a locker room of each of the studied unit, which was specifically designed for staff nurses to change dressing and keep their personal stuffs. The researcher also asked the head nurse to announce that the collection box was not allowed to be opened by anyone except the researcher to increase participant's confidence to reply their questionnaires. The approach of putting the collection box in the specific locker room not only can provide an easy access for participants to return the questionnaire but also can protect the participants' confidentiality. All collection boxes was checked and replaced by the researcher in a 7 days interval.

Because most of Taiwanese participants preferred to know the deadline for returning the questionnaire to the researcher when attending a survey, according to the researcher's previous experience in performing survey studies in Taiwan. This investigation informed the prospective participants that the data collection of this investigation continued for 30 days. In order to increase the response rate this investigation encouraged all the prospective participants to fill out and reply the questionnaires within 14 days or at their earliest convenience. On the following 14^{th} day and the 21^{th} day, the researcher asked the head nurse in each of the studied unit to help

post a reminder letter (see Appendix O) and formally announce the information written in the reminder letter. This approach encouraged staff nurses who did not reply the questionnaires to return their questionnaires to increase response rate. The data collection was completed within one month to prevent the participants' responses being confounded by any unforeseeable events. Specifically, the prospective participants selected for evaluating the test-retest reliability of the instruments were asked to fill in and reply the questionnaires within 14 days. However, if subjects replied their post-test questionnaires latter than 14 days, their replied questionnaires were discard to prevent factors confounding participants' responses and consequently threatening the test-re-test reliability of the instrument.

Data Treatment

Questionnaires returned from the participants were examined for completeness first. Questionnaires with missing data of more than 10% of item data were excluded from data analysis. Data were entered into a computer by the researcher using Statistic Package for the Social Science (SPSS), Version 15.0. The accuracy of entering data into computer was ensured by two approaches. First, cross-checking the questionnaires with the computer data files was performed. Second, scanning frequencies on all variables was performed to detect any out-of-range number. The original questionnaire for the wrongly entered data found were re-examined for correction. After the correction of entering data was obtained, descriptive statistics on all variables was computed and examined for systematic missing data, marked skewness, and outliers.

Frequencies of missing data on all variables were first be checked to detect the presence of random or systematic missing data. A 5% critical value was used to determine the pattern of missing data. Variables having more than 5% missing were further analyzed to determine if the data are systemically missing. After missing data was handled, skewness statistics were used to assess normality of data distribution. Fisher coefficient of skewness was used to detect marked skewness. A marked skewness was determined by the ratio of the skewness statistics divided by its standard error less than -1.96 or greater than 1.96. Prior to further data analyses, marked skewness data were handled using methods proposed by Ferketich and Verran (1994) to achieve normality of distribution on continuous variables for meeting the assumptions of parametric statistical test.

Data Analyses

Descriptive statistics such as mean, mode, median, and standard deviation were computed for continuous demographic data and items responses for the questionnaires. Frequency counts and percentages were computed for categorical demographic data. Because the Chinese version of the PPE Scale questionnaires was constructed by combining 38 PPE items, 27 new items and 1 adapted PPE item, collected data were major split into two files for analysis. The first file only included 38 PPE items for psychometric evaluation and the second file included all of the 66 items on the Chinese version of the PPE Scale for analyses.

During the psychometric evaluation phase, relevant statistical analyses were

performed to answer the study questions. In order to answer the Research question 1, ″To what extent can the equivalence of the translated-adapted Chinese version of the PPE Scale as relative to the English version of the PPE Scale be demonstrated through the use of translation and adaptation techniques?”, the concept equivalence of the 38 PPE items on the Chinese version of the PPE Scale as relative to the English version of the PPE Scale was examined to test partial of the research hypothesis for Research question 1. In order to answer the Research question 2, ″To what extent can the psychometric properties of the translated-adapted Chinese version of the PPE Scale be demonstrated in a sample of Taiwanese nurses working in acute care settings ?”, the psychometric properties of the 66-item Chinese version of the PPE Scale was evaluated to test the research hypothesis for Research question 2. The 38 PPE items and the total 66 items on the Chinese version of the PPE Scale were separately analyzed by using principal components factor analysis (PCA) with Varimax rotation and Kaiser normalization to assess the dimensional structure within the items (Nunnally, & Berstein, 1994).

Prior to performing PCA, item-total correlations were computed for the analyzed items. Any item with item-total correlation level of less than .30 was carefully reviewed. Then, the standardized Cronbach’s alpha for the items was computed for assessing the internal consistency reliability of the total instrument. In order to ensure the suitability of data for factor analysis, Kaiser-Meyer-Olkin (KMO) measure and Bartlett’s Test of Sphericity were first assessed. KMO is a measure of whether the distribution of values is adequate for conducting factor analysis. An acceptable KMO value was set of greater

than .70 in this study (Munro, 2001). Bartlett's Test is a measure of the multivariate normality of a set of distributions. A significant value that the data are not significantly different from multivariate normal was set as the desired result in Bartlett's Testis in this study (Munro, 2001). In this study, PCA with Varimax rotation and Kaiser normalization were conducted to establish the validity of the instrument by finding the latent constructs underlying the analyzed itms. A criterion of a minimum of 1 for eigenvalue and an inspection of the Scree Plot were used to determine the number of the components within the instrument. Moreover, a loading criterion of a minimum of .30 was used to identify meaningful items contribution to a factor. The best resulting factor component was determined by the parsimonious and interpretable solution. Internal consistency reliability using Chronbach's alpha was computed for the PCA-derived scales. As a newly constructed scale, the criterion of acceptable Cronbach's alpha coefficients of each subscale and total score of the scale in this study was set as .70 or greater to support its reliability (Nunnally & Bernstain, 1994).

In this study, for testing the hypothesis for Research question 1, the conceptual equivalence was supported if the PCA reveals that the number of extracted factors and the 38 items loaded on the relevant factors were as the same as the original PPE Scale; and that the internal consistency coefficient using Chronbah's Alpha for each subscales and the total scale were .70 or greater. For testing the hypothesis for Research question 2, the acceptable psychometric properties were determined by that PCA revealed a parsimonious and interpretable solution in the scale and the Chronbach's alpha of each

subscale and total scale were .70 or greater (Nunnally & Bernstain, 1994).

With regard to Research question 3: To what extent do selected demographics and variables explain Taiwanese nurses' perceptions of their professional practice environment, the third research hypothesis proposed was tested. The total score of the translated-adapted Chinese version of the PPE Scale was set up as a dependent variable for multiple linear regression analyses. The hypothesis was supported by finding significant relationships between the total scores of the translated-adapted Chinese version of the PPE Scale and the selected demographic and variables.

Because the Chinese PPE Scale provided comment area for participants to freely describe any comment regarding to their practice environment, content analysis was used to identify the categories and themes found in the nurses' descriptions to better explain the relevant findings in this study. Content analysis is a research methodology utilizing a set of procedures to make valid inferences from text (Weber, 1985). Content analysis concerned with meanings, intentions, consequences, and context to meet the goal of enhancing the inferential quality of the results by relating the categories to the context or environment that producing the data (Downe-Wamboldt, 1992). Content analysis could be used for revealing the focus of individual; reflecting cultural patterns and beliefs and describing themes, trends or other characteristics in communication content (Weber, 1985; Downe-Wamboldt, 1992). In this study, the comments written by the participants were organized by typing the statements in to a computer for further content analysis. The transcribed copy was reviewed twice by comparing to the questionnaire content for accuracy.

The procedures of data analysis proposed by Downe-Wamboldt (1992) were applied in this study, which included selecting the unit of analysis; creating the categories, pre-testing the category, assessing reliability and validity; and coding the data. The unit of analysis for this study included the complete thought, ranging from one word to several sentences. The researcher carefully read hard copy of the description data to realize the meaning and concepts from the context. Categories and themes derived from participants' descriptions relating to their practice environments were identified. The coding began from general concepts, such as negative perceptions and positive perceptions, and then move to categories such as hospital level and unit level. Finally, the coding proceeded to the more specific concepts found in the various themes. Categories and themes wee created by the researcher and tested by review them with one of the developers (Dr. Dorothy Jones) of the original PPE Scale who had lot of experience in qualitative research and was the one in charge of analysis nurses' comments on their practice environment when the PPE Scale was used for survey at MGH. The reliability (inter-rater reliability) was constructed through comparing the similarity of coding data between the researcher and the consulted scholar.

Summary

This investigation was accomplished by two study phases. Multiple samplings and instruments were utilized in each of the study phase (see Table 4 and Table 5). Thorough translation procedures containing at least 20 steps were performed to produce quality translations. Multiple data analyses through testing hypotheses derived from

research questions were used to empirically test the equivalence and psychometric properties of the translation instruments. Content analysis was also applied to analyze participants; comments about their practice environment.

Table 4

Summary of Sampling and Corresponding Function of Subjects

Timing	Subjects	Number of subjects	Function of subjects
Phase I : Stage I	1.Translators in the forward translation group	2	Translating the English PPE Scale into Chinese
	2. Translators in the back translation group	2	Back translating the Chinese PPE Scale into English
	3. Bilingual experts in Panel A	5	Evaluating the semantic equivalence between the original English PPE Scale and the translated Chinese PPE Scale
	4. Bilingual experts in Panel B	5	Evaluating the semantic equivalence between the back- translated English PPE and the translated Chinese PPE Scale
	5. Monolingual reviewers	5	Evaluating the understandability, clarity, and readability of the translated Chinese PPE Scale

Table 4 (continued)

Summary of Sampling and Corresponding Function of Subjects

Timing	Subjects	Number of subjects	Function of subjects
Phase I: Stage I	6. Monolingual experts	3	Evaluating the semantic equivalence between the original English PPE Scale and the back- translated English PPE Scale
	7. Monolingual participants	10	Testing the semantic equivalence between the original English PPE Scale and the back- translated English PPE Scale
	8. Bilingual participants	35	Testing the semantic equivalence between the original English PPE Scale and the translated Chinese PPE Scale
Phase I:	9. Content validity experts	10	Validating the translated Chinese PPE Scale
Stage II	10.Focus group	5	Validating the translated Chinese PPE Scale

Table 4 (continued)

Summary of Sampling and Corresponding Function of Subjects

Timing	Subjects	Number of subjects	Function of subjects
Phase I: Stage II	11. Prospective participants for presetting the adapted Chinese PPE Scale	5	Evaluating the understandability, clarity, and readability of the adapted Chinese PPE Scale
Phase II:	12. Prospective participants for presetting the Tested Chinese PPE Scale	10	Identifying any foreseeable problems in formal administration of the tested Chinese PPE Scale
	13. Participants for psychometric evaluation	997	Providing scores on perceptions of professional practice environment for psychometric analyses

Table 5

Summary of Data Collection and Corresponding Measurement

Timing	Instruments	Subjects	Variable
Phase I: Stage I	1. Forward Translation Sheets	Translators in forward translation group	Chinese translation
	2. Translation Equivalence Questionnaire for Original English and Translated Chinese versions of the PPE Scale	Bilingual experts in Panel A	Semantic equivalence of the Chinese translation
	3. Monolingual Reviewer Questionnaire for the Translated Chinese Version of the PPE Scale	Monolingual reviewers recruited from Taiwanese nurses	Understandability, clarity, and readability of the Chinese translation
	4. Backward Translation Sheets	Translators in back translation group	Back-translated English translation
	5. Translation Equivalence Questionnaire for Translated Chinese and Back-Translated English Versions of the PPE Scale	Bilingual experts in Panel B	Semantic equivalence of the back-translated English translation

Table 5 (continued)

Timing	Instruments	Subjects	Variable
Phase I: Stage I	6. Translation Equivalence Questionnaire for Original English and Back-Translated English Versions of the PPE Scale	Monolingual experts	Semantic equivalence of the back-translated English translation
	7. Back-Translated English Version of the PPE Scale	Monolingual participants recruited from American nurses	Semantic equivalence of the back-translated English translation
	8. Translated Chinese Version of the PPE Scale	Bilingual participants	Semantic equivalence of the Chinese translation
Phase I: Stage II	9. Content Validity Questionnaire of the Translated Chinese Version of the PPE Scale for Taiwanese Experts	Taiwanese content validity experts	Content equivalence of the Chinese translation

Table 5 (continued)

Timing	Instruments	Subjects	Variable
Phase I: Stage II	10. Content Validity Questionnaire of the Translated Chinese Version of the PPE Scale for Focus Group	Focus Group recruited from Taiwanese nursing leaders	Content equivalence of the Chinese translation
	11. The Adapted Chinese Version of the PPE Scale	Prospective participants for pretesting	Face validity of the adapted Chinese PPE Scale
	12. Face Validity Questionnaire for the Adapted Chinese Version of the PPE Scale	Prospective participants for pretesting	Understandability, clarity, and readability of the adapted Chinese PPE Scale
Phase II	13. Tested Chinese version of the PPE Scale	Study population	Perceptions with professional practice environment
	14. Demographics sheets	Study population	Demographic information

CHAPTER IV

RSULTS OF TRANSLATION AND ADAPTATION

Introduction

This study was accomplished through two phases: Phase I, instrument translation and adaptation, and Phase II, psychometric evaluation. Phase I was accomplished through two stages to achieve the goals which were (a) producing an accurate translation of the PPE Scale, written in Chinese, (b) validating the translated Chinese version of the PPE Scale and (c) adapting the translated Chinese version of the PPE Scale as needed to fit in Taiwanese practice culture. This chapter separately presents results from the two stages of Phase I.

Stage I Results of Semantic Equivalence

The first research question of this study was: to what extent can the equivalence of the translated-adapted Chinese version of the PPE scale as relative to the English version of the PPE scale be demonstrated through the use of translation and adaptation techniques? In order to answer this research question, the research hypothesis tested was that the translated Chinese version of the PPE Scale demonstrates semantic, content, and conceptual equivalence as relative to the English version of the PPE Scale. In stage I, the semantic equivalence of the translated-adapted Chinese items as relative to the English version of the PPE Scale was evaluated to test a part of the hypothesis for research question 1. The semantic equivalence between the translated-adapted Chinese PPE Scale and the original English version of the PPE Scale was evaluated twice. Evaluating

semantic equivalence during the translation process and empirical testing semantic equivalence after translation were constructed. Results of semantic equivalence as relevant to those methods and the instruments developed through translation and adaptation processes are separately presented as below.

Evaluations of Semantic Equivalence during Translation Process

Pursuing quality translation was a key concern in this study in order to maintain the semantic equivalence between the original English version of the PPE Scale and the Chinese version of PPE Scale. During the translation process, three translation validity indices (TVI) were computed and the understandability, clarity, and the readability of the Chinese version of PPE Scale were examined to ensure quality translation with satisfactory semantic equivalence.

Semantic Equivalence between the Original English Version of the PPE Scale and the Translated-Adapted Chinese Version of the PPE Scale from Bilingual Experts in Panel A

By responding on a 4-point Likert scale, where 1= totally different to 4 = equivalent, the ive bilingual experts in panel A were asked to use the original English version of the PPE Scale as the gold standard to evaluate the equivalence of the 58 variables which included 8 concept headings, 8 concept definitions, 38 items, 4 responses. The first run results indicated 46 of the 58 evaluated variables (79.31%) were rated on score ″3″or ″4”and only 36 of the 58 evaluated variables (62.07%) were rated on score ″4″by at least 4 of the reviewers. By summing the percentage of agreements on scores ″3″or ″4”, the average TVI of assessments rated for the total scale was .94. By summing

the percentage of agreements on scores ″4”, the average TVI of assessments rated for the total scale was .75. All the problematic items which did not reach the minimal level of TVI in this study, 100% of assessments rated on score ″3″or ″4”, were passed back to translators for revision and to bilingual experts for reevaluation. After several runs of revisions and re-evaluations, the final results indicated that all the 58 evaluated variables (100%) were rated on score ″3″or ″4”and all the evaluated variables reached the maximal level of TVI in this study, which was 80% of assessments rated on score ″4”. Fifty of the 58 evaluated variables (86.21%) were rated by all of the reviewers on score ″4”. All the variables were rated on score ″4″by at least 4 of the 5 reviewers. By summing the percentage of agreements on scores ″3″or ″4”, the average TVI of assessments rated for the total scale was 1. By summing the percentage of agreements on scores ″4”, the average TVI of assessments rated for the total scale was .97 (see Table 6).

Understandability, Clarity, and the Readability of the Translated-Adapted Chinese Version of the PPE Scale

By responding on a 4-point Likert scale, a group of five Taiwanese nurses were asked to serve as monolingual reviewers to evaluate the understandability, clarity, and the readability of the preliminary Chinese translation for the PPE Scale. By summing the percentage of agreement for items rated on ‘3’ or ‘4’ and the percentage of agreement for items rated on ‘4’ , the first run results indicated that the average index of understandability, clarity, or readability for the total 38-item scale was all greater than .80. Few items’ indices of understandability, clarity, or readability for some of items were less

than .80 (see Table 7). The comments on the intention of items reported by the five nurses were judged by the researcher. By rating the comments as score 1 (correct) or score 0 (incorrect) for every item, the average score of the item intension was 1 for the total scale. The results indicated that nurses well understood the meaning for each of the 38 items on Chinese translation draft.

Table 6

Semantic Equivalence between the Original English Version of the PPE Scale and the Translated-Adapted Chinese Version of the PPE Scale from Bilingual Experts in Panel A (N=5)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 1 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 1 definition	0	0	20	80	1	.80	0	0	0	100	1	1
21	0	0	60	40	1	.40	0	0	0	100	1	1
22	0	20	40	40	.80	.40	0	0	0	100	1	1
23	0	20	80	0	.80	0	0	0	0	100	1	1
24	0	20	60	20	.80	.20	0	0	0	100	1	1
25	0	20	20	60	.80	.60	0	0	0	100	1	1
26	0	20	40	40	.80	.40	0	0	0	100	1	1
27	0	0	60	40	1	.40	0	0	0	100	1	1
28	0	0	20	80	1	.80	0	0	0	100	1	1

Table 6 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 2 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 2 definition	0	20	20	60	.80	.60	0	0	20	80	1	.80
29	0	0	40	60	1	.60	0	0	20	80	1	.80
30	0	0	20	80	1	.80	0	0	0	100	1	1
31	0	20	20	60	.80	.60	0	0	0	100	1	1
32	0	0	20	80	1	.80	0	0	0	100	1	1
33	0	0	0	100	1	1	0	0	0	100	1	1
34	0	20	20	60	.80	.60	0	0	0	100	1	1
35	0	0	0	100	1	1	0	0	0	100	1	1
Concept 3 heading	0	0	20	80	1	.80	0	0	0	100	1	1
Concept 3 definition	0	20	60	20	.80	.20	0	0	0	100	1	1
5	0	0	40	60	1	.60	0	0	20	80	1	.80
6	0	0	20	80	1	.80	0	0	0	100	1	1
7	0	0	0	100	1	1	0	0	0	100	1	1
8	0	0	0	100	1	1	0	0	0	100	1	1
10	0	0	0	100	1	1	0	0	0	100	1	1
11	0	20	20	60	.80	.60	0	0	0	100	1	1
14	0	0	40	60	1	.60	0	0	0	100	1	1

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 6 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 4 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 4 definition	0	20	20	60	.80	.60	0	0	0	100	1	1
1	0	0	0	100	1	1	0	0	0	100	1	1
2	0	0	20	80	1	.80	0	0	20	80	1	.80
3	0	0	0	100	1	1	0	0	0	100	1	1
9	0	0	0	100	1	1	0	0	0	100	1	1
12	0	0	40	60	1	.60	0	0	0	100	1	1
Concept 5 heading	0	0	20	80	1	.80	0	0	0	100	1	1
Concept 5 definition	0	20	20	60	.80	.60	0	0	20	80	1	.80
4	0	0	0	100	1	1	0	0	0	100	1	1
13	0	0	0	100	1	1	0	0	0	100	1	1
Concept 6 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 6 definition	0	0	20	80	1	.80	0	0	20	80	1	.80
15	0	0	0	100	1	1	0	0	0	100	1	1
16	0	0	0	100	1	1	0	0	0	100	1	1

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 6 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 7 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 7 definition	0	0	60	40	1	.40	0	0	0	100	1	1
17	0	0	20	80	1	.80	0	0	0	100	1	1
18	0	0	0	100	1	1	0	0	0	100	1	1
19	0	0	20	80	1	.80	0	0	20	80	1	.80
20	0	0	0	100	1	1	0	0	0	100	1	1
Concept 8 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 8 definition	0	0	20	80	1	.80	0	0	0	100	1	1
36	0	0	80	20	1	.20	0	0	20	80	1	.80
37	0	0	40	60	1	60	0	0	0	100	1	1
38	40	0	0	60	.60	.60				100	1	1
Response 1	0	0	20	80	1	.80	0	0	0	100	1	1
Response 2	0	0	0	100	1	1	0	0	0	100	1	1
Response 3	0	0	0	100	1	1	0	0	0	100	1	1
Response 4	0	0	20	80	1	.80	0	0	0	100	1	1
Total scale					.94	.75					1	.97

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 7

Understandability, Clarity, and the Readability of the Translated-Adapted Chinese Version of the PPE Scale (N=5)

	First run						Final run					
	UI		CI		RI		UI		CI		RI	
Variables	I^a	I^b	I^a	I^b	I^a	I^b	I^a	I^b	I^a	I^b	I^a	I^b
1	1	.80	1	.80	1	.80	1	.80	1	1	1	.80
2	.60	.40	.80	.40	.80	.80	.80	.40	.80	.80	1	.80
3	1	.80	1	.60	1	.80	1	1	1	1	1	.80
4	1	.80	.80	1	1	1	1	1	1	1	1	.80
5	.80	.60	.80	.60	.80	.60	1	1	1	1	1	.80
6	1	.20	1	.20	1	.40	1	1	1	1	1	1
7	1	.80	1	.80	1	1	1	1	1	1	1	1
8	1	.60	1	.60	1	.60	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1
10	1	.80	1	1	1	1	1	1	1	1	1	1
11	.80	.40	.80	.20	1	.20	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	1	1	1	1
14	1	.80	1	.60	1	.60	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1	1	1	1	1	1
17	.80	.40	1	.40	1	.20	1	1	1	1	1	.80
18	1	1	1	.80	1	.60	1	1	1	.80	1	.80
19	1	.80	1	.80	1	.80	1	.8	1	.80	1	.80

Note. UI = Understandability Index; CI = Clarity Index; RI = Readability Index;
I^a = % of score rated on ″3″or ″4”; I^b = % of score rated on ″4″

Table 7 (continued)

	First run						Final run					
	UI		CI		RI		UI		CI		RI	
Variables	I^a	I^b	I^a	I^b	I^a	I^b	I^a	I^b	I^a	I^b	I^a	I^b
20	1	.40	1	.40	1	.40	1	1	1	1	1	1
21	1	.80	1	.80	1	.80	1	.80	1	.80	1	.80
22	1	1	1	1	1	1	1	1	1	1	1	1
23	1	1	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	1	1	1	1	1
25	1	.80	1	.80	1	.80	1	.80	1	.80	1	.80
26	1	1	1	.80	1	.80	1	1	1	1	1	.80
27	1	.80	1	.80	1	.80	1	.80	1	.80	1	.80
28	1	.80	1	.80	1	.80	1	.80	1	.80	1	.80
29	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1
31	1	1	1	1	1	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1	1	1	1	1	1
33	1	1	1	1	1	1	1	1	1	1	1	1
34	1	1	1	1	1	1	1	1	1	1	1	1
35	1	1	1	1	1	1	1	1	1	1	1	1
36	1	1	1	1	1	1	1	1	1	1	1	1
37	1	1	1	1	1	1	1	1	1	1	1	1
38	1	1	1	1	1	1	1	1	1	1	1	1
Total scale	.97	.84	.98	.82	.99	.84	.99	.95	.99	.96	1	.93

Note. UI = Understandability Index; CI = Clarity Index; RI = Readability Index;
I^a = % of score rated on ″3″or ″4”; I^b = % of score rated on ″4″

The initial evaluation results supported that understandability, clarity, and the readability of the preliminary Chinese version of the PPE Scale were satisfactory. In order to pursue a best Chinese version of the PPE Scale, the researchers also carefully read reviewers' suggestions. In general, reviewers' suggestions focused on rewording some items to increase clarity. The researcher noted that Item No 2 was the one that many reviewers had opinions about, although the comments on the intention of items reported by the 5 reviewers indicated that they understood what the item was asking for. Reviewers proposed different suggestions for revision. For example, some reviewers suggested changing the original subject, nursing, as staff nurses. Some reviewers suggested more elaborating what the practice referred to. Several discussions with some of the bilingual experts in panel A, the Taiwanese nurses, and translators for forward translation and one of the developers for the PPE Scale were constructed to help the researcher make the decision in revising the translated Chinese version of the PPE Scale. Finally, Item No 2, nursing controls its own professional practice, was decided to remain the subject as nursing without adding any statement for the practice in order to be equivalent with English PPE scale. Only some items were slightly revised to more increase the clarity of the statement but the meaning and concepts of the items remained the same as the English version of the PPE Scale. For example, items without a clear subject for the respondents to refer to were changed. For example, ″Opportunity to work on highly specialized patient care unit″was changed to ″Staff nurses have the opportunity to work on highly specialized patient care unit″to indicate that the staff nurse was the

subject. A defined setting was added in items noted by reviewers to be ambiguous in choosing a unit level or hospital level for responding to. For example, Item No 8, enough staff to provide quality patient care, was changed to 'This unit has enough staff nurses to provide quality patient care'. All the revised items were sent back to the 5 Taiwanese nurses for further evaluation.

The final results indicated that the index of understandability, clarity, or readability for each of the 38 translated items was greater than .80. By summing the percentage of agreement for items rated on '4' by the reviewers, the indices of understandability, clarity, and readability for the total 38-item scale were .95, .96, and .93, respectively. By summing the percentage of agreement for all items rated on '3' or '4' , the indices of understandability, clarity, and readability for the total 38-item scale were .99, .99, and 1, respectively (see Table 7). The results supported that the understandability, clarity, or readability for the translated-adapted Chinese Version of the PPE Scale were satisfactory.

Semantic Equivalence Between the Translated-Adapted *Chinese Version of the PPE Scale and the Back-translated English Version of the PPE scale from Bilingual Experts in Panel B*

The five bilingual experts in panel B were asked to use the translated-adapted Chinese version of the PPE Scale as the gold standard and respond on a 4-point Likert scale, where 1= totally different to 4 = equivalent, to evaluate the equivalence of the back-translated English version of the PPE scale. Fifty-eight variables were evaluated

included eight concept headings, eight concept definitions, 38 items, four responses. As shown in Table 8, the first run results indicated all of the 58 evaluated variables (100 %) were rated on score ″3″or ″4”and 44 of the 58 evaluated variables (75.86 %) were rated by at least 4 of the reviewers on score ″4”. By summing the percentage of agreements on scores ″3″or ″4”, the average TVI of assessments rated for the total scale was 1. By summing the percentage of agreements on scores ″4”, the average TVI of assessments rated for the total scale was .83. The 14 problematic items which did not reach the maximal level of TVI in this study, 80% of assessments rated on score ″4”, were passed back to translators for revision and to bilingual experts for reevaluation. The final results indicated that all the 58 evaluated variables (100%) were rated on score ″3″or ″4”and all the evaluated variables were rated by at least 4 of the five reviewers on score ″4”. Fifty-six of the 58 evaluated variables (96.55 %) were rated by all of the reviewers on score ″4”. By summing the percentage of agreements on scores ″3″or ″4”, the average TVI of assessments rated for the total scale was 1. By summing the percentage of agreements on scores ″4”, the average TVI of assessments rated for the total scale was .99.

Table 8

Semantic Equivalence between the Translated-Adapted Chinese Version of the PPE Scale and the Back-Translated English Version of the PPE Scale from Bilingual Experts in Panel B (N=5)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 1 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 1 definition	0	0	0	100	1	1	0	0	0	100	1	1
21	0	0	20	80	1	.80	0	0	0	100	1	1
22	0	0	40	60	1	.60	0	0	0	100	1	1
23	0	0	20	80	1	.80	0	0	20	80	1	.80
24	0	0	0	100	1	1	0	0	0	100	1	1
25	0	0	40	60	1	.60	0	0	0	100	1	1
26	0	0	20	80	1	.80	0	0	0	100	1	1
27	0	0	0	100	1	1	0	0	0	100	1	1
28	0	0	0	100	1	1	0	0	0	100	1	1
Concept 2 heading	0	0	20	80	1	.80	0	0	0	100	1	1
Concept 2 definition	0	0	60	40	1	.40	0	0	0	100	1	1
29	0	0	20	80	1	.80	0	0	0	100	1	1
30	0	0	60	40	1	.40	0	0	0	100	1	1
31	0	0	0	100	1	1	0	0	0	100	1	1
32	0	0	80	20	1	.20	0	0	20	80	1	.80
33	0	0	40	60	1	.60	0	0	0	100	1	1
34	0	0	40	60	1	.60	0	0	0	100	1	1
35	0	0	20	80	1	.80	0	0	0	100	1	1

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 8 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 3 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 3 definition	0	0	40	60	1	.60	0	0	20	80	1	.80
5	0	0	40	60	1	.60	0	0	0	100	1	1
6	0	0	20	80	1	.80	0	0	0	100	1	1
7	0	0	0	100	1	1	0	0	0	100	1	1
8	0	0	20	80	1	.80	0	0	0	100	1	1
10	0	0	0	100	1	1	0	0	0	100	1	1
11	0	0	40	60	1	.60	0	0	0	100	1	1
14	0	0	20	80	1	.80	0	0	0	100	1	1
Concept 4 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 4 definition	0	0	20	80	1	.80	0	0	0	100	1	1
1	0	0	0	100	1	1	0	0	0	100	1	1
2	0	0	20	80	1	.80	0	0	0	100	1	1
3	0	0	40	60	1	.60	0	0	0	100	1	1
9	0	0	0	100	1	1	0	0	0	100	1	1
12	0	0	20	80	1	.80	0	0	0	100	1	1
Concept 5 heading	0	0	40	60	1	.60	0	0	0	100	1	1
Concept 5 definition	0	0	0	100	1	1	0	0	0	100	1	1
4	0	0	20	80	1	.80	0	0	0	100	1	1
13	0	0	40	60	1	.60	0	0	0	100	1	1

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 8 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 6 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 6 definition	0	0	20	80	1	.80	0	0	0	100	1	1
15	0	0	0	100	1	1	0	0	0	100	1	1
16	0	0	0	100	1	1	0	0	0	100	1	1
Concept 7 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 7 definition	0	0	40	60	1	.60	0	0	0	100	1	1
17	0	0	0	100	1	1	0	0	0	100	1	1
18	0	0	20	80	1	.80	0	0	0	100	1	1
19	0	0	20	80	1	.80	0	0	0	100	1	1
20	0	0	0	100	1	1	0	0	0	100	1	1
Concept 8 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 8 definition	0	0	0	100	1	1	0	0	0	100	1	1
36	0	0	0	100	1	1	0	0	0	100	1	1
37	0	0	20	80	1	.80	0	0	0	100	1	1
38	0	0	20	80	1	.80	0	0	0	100	1	1
Response 1	0	0	0	100	1	1	0	0	0	100	1	1
Response 2	0	0	0	100	1	1	0	0	0	100	1	1
Response 3	0	0	0	100	1	1	0	0	0	100	1	1
Response 4	0	0	0	100	1	1	0	0	0	100	1	1
Total scale					1	.83					1	.99

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Semantic Equivalence Between the Original English Version of the PPE Scale and the Back-translated English Version of the PPE Scale from Monolingual Experts

Three American experts who are the developers of the PPE Scale were asked to serve as monolingual experts to use the original English version of the PPE Scale as the gold standard to evaluate the equivalence of the back-translated English version of the PPE scale. Through responding on a 4-point Likert scale, where 1= totally different to 4 = equivalent, all the eight concept headings, eight concept definitions, 38 items, and four responses were elevated. As shown in Table 9, the first run results indicated all of the 57 of the 58 evaluated variables (98.38 %) were rated on score ″3″or ″4”and 43 of the 58 evaluated variables (74.14 %) were rated by all of the 3 reviewers on score ″4”. By summing the percentage of agreements on scores ″3″or ″4”, the average TVI of assessments rated for the total scale was .99. By summing the percentage of agreements on scores ″4”, the average TVI of assessments rated for the total scale was .90. The 15 problematic items which were not rated by all of the 3 experts on score ″4″were passed back to translators for revisions and to monolingual experts for re-evaluations. The final results indicated that all the evaluated variables (100%) were rated on score ″3″or ″4”and 53 of the 58 evaluated variables (91.38 %) were rated by all of the 3 experts on score ″4”. Five items were not rated by all of the 3 experts on score ″4”, which included Item 2, 7, 26, definitions of Concept 3 and Concept 6. Among these 5 items, four of them were rated by at least 2 of the 3 experts on score ″4”. By summing the percentage of agreements on scores ″3″or ″4”, the average TVI of assessments rated for the total scale was 1. By summing the percentage of agreements on scores ″4”, the average TVI of

assessments rated for the total scale was .97.

In sum, the evaluations of semantic equivalence during the translation process indicated that the translated-adapted Chinese version of the PPE Scale demonstrated satisfactory semantic equivalence as relative to the English version of the PPE Scale through the quality translation and adaptation.

Table 9

Semantic Equivalence between the Original English Version of the PPE Scale and the Back-Translated English Version of the PPE Scale from Monolingual Experts

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 1 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 1 definition	0	33	33	33	.66	.33	0	0	0	100	1	1
21	0	0	0	100	1	1	0	0	0	100	1	1
22	0	0	0	100	1	1	0	0	0	100	1	1
23	0	0	0	100	1	1	0	0	0	100	1	1
24	0	0	0	100	1	1	0	0	0	100	1	1
25	0	0	0	100	1	1	0	0	0	100	1	1
26	0	0	66	33	1	.33	0	0	33	66	1	.66
27	0	0	0	100	1	1	0	0	0	100	1	1
28	0	0	0	100	1	1	0	0	0	100	1	1

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 9 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 2 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 2 definition	0	0	0	100	1	1	0	0	0	100	1	1
29	0	0	0	100	1	1	0	0	0	100	1	1
30	0	0	33	66	1	.66	0	0	0	100	1	1
31	0	0	33	66	1	.66	0	0	0	100	1	1
32	0	0	0	100	1	1	0	0	0	100	1	1
33	0	0	0	100	1	1	0	0	0	100	1	1
34	0	0	0	100	1	1	0	0	0	100	1	1
35	0	0	0	100	1	1	0	0	0	100	1	1
Concept 3 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 3 definition	0	0	33	66	1	1	0	0	33	66	1	.66
5	0	0	0	100	1	1	0	0	0	100	1	1
6	0	0	0	100	1	1	0	0	0	100	1	1
7	0	0	33	66	1	.66	0	0	66	33	1	.33
8	0	0	0	100	1	1	0	0	0	100	1	1
10	0	0	33	66	1	.66	0	0	0	100	1	1
11	0	0	0	100	1	1	0	0	0	100	1	1
14	0	0	33	66	1	.66	0	0	0	100	1	1

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 9 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 4 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 4 definition	0	0	0	100	1	1	0	0	0	100	1	1
1	0	0	33	66	1	.66	0	0	0	100	1	1
2	0	0	33	66	1	.66	0	0	33	66	1	.66
3	0	0	0	100	1	1	0	0	0	100	1	1
9	0	0	0	100	1	1	0	0	0	100	1	1
12	0	0	0	100	1	1	0	0	0	100	1	1
Concept 5 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 5 definition	0	0	0	100	1	1	0	0	0	100	1	1
4	0	0	0	100	1	1	0	0	0	100	1	1
13	0	0	0	100	1	1	0	0	0	100	1	1
Concept 6 heading	0	0	33	66	1	.66	0	0	33	66	1	.66
Concept 6 definition	0	0	0	100	1	1	0	0	0	100	1	1
15	0	0	0	100	1	1	0	0	0	100	1	1
16	0	0	0	100	1	1	0	0	0	100	1	1
Concept 7 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 7 definition	0	0	33	66	1	.66	0	0	0	100	1	1
17	0	0	0	100	1	1	0	0	0	100	1	1
18	0	0	0	100	1	1	0	0	0	100	1	1
19	0	0	0	100	1	1	0	0	0	100	1	1
20	0	0	0	100	1	1	0	0	0	100	1	1

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Table 9 (continued)

	First run agreement (%)						Final run agreement (%)					
Variables	1	2	3	4	TVI[a]	TVI[b]	1	2	3	4	TVI[a]	TVI[b]
Concept 8 heading	0	0	0	100	1	1	0	0	0	100	1	1
Concept 8 definition	0	0	33	66	1	.66	0	0	0	100	1	1
36	0	0	33	66	1	.66	0	0	0	100	1	1
37	0	0	66	33	1	.33	0	0	0	100	1	1
38	0	0	0	100	1	1	0	0	0	100	1	1
Response 1	0	0	0	100	1	1	0	0	0	100	1	1
Response 2	0	0	0	100	1	1	0	0	0	100	1	1
Response 3	0	0	0	100	1	1	0	0	0	100	1	1
Response 4	0	0	0	100	1	1	0	0	0	100	1	1
Total scale					.99	.90					1	.97

Note. TVI[a] = % of score rated on ″3″or ″4″; TVI[b] = % of score rated on ″4”

Draft of the Instruments Produced Through Translation and Adaptation

Through a series of rigorous translation and adaptation processes, the drafts of the translated-adapted Chinese version of the PPE Scale and the back-translated English version of the PPE Scale were produced (see Table 10)

Table 10

Translated-Adapted Chinese Version of the PPE Scale and the Back-Translated Elglish Version of the PPE Scale

Item	Contents
1	E. Leadership supportive to department or unit staff.
	C.護理長支持單位的護理人員。
	B. Head nurse supports staff nurses in the unit.
2	E. My discipline controls its own practice.
	C.在本單位裡,護理掌控了自己的專業實務。
	B. In this unit, nursing controls its own professional practice.
3	E. Freedom to make important patient care and work decisions.
	C.護理人員具有對病人照護和工作做重要決策的自由。
	B. Staff nurses have freedom to make important patient care and work decisions.
4	E. A lot of teamwork between physicians and staff.
	C.醫師們和護理人員之間有很多團隊合作。
	B. There is a lot of teamwork between staff nurses and doctors.
5	E. Patient care assignments that foster continuity of care.
	C.在本單位裏，病人照護的工作分派促進了照護的連續性。
	B. In this unit, patient care assignment facilitates the continuity of care.
6	E. Adequate support services allow me to spend time with patients.
	C.本院有足夠的支持性服務(例如：社會服務部門、轉送中心、醫事部門…等)，使我能將時間放在病人身上。
	B. This hospital has enough support services such as social services department, transferring center, medical affairs division, etc. to allow me to spend time with patients.

Note. E = Original English version; C = Translated-Adapted Chinese version;
B = Back-translated English version

Table 10 (continued)

Item	Contents
7	E. Enough time and opportunity to discuss patient care problems with other staff. C.我有足夠的時間和機會與其他的醫療人員討論照護病人的問題。 B. I have sufficient time and opportunity to discuss patient care problems with other staff nurses.
8	E. Enough staff to provide quality patient care. C.本單位有足夠的護理人員來提供具有品質的病人照護。 B. This unit has enough staff nurses to provide quality patient care.
9	E. A manager who is a good manager and leader. C.護理長是一個好的管理者和領導者。 B. Head nurse is a good manager and leader.
10	E. Enough staff to get the work done. C.本單位有足夠的護理人員來完成病人照護工作。 B. This unit has enough staff nurses to get the patient care work done.
11	E. Opportunity to work on highly specialized patient care unit. C.護理人員有機會在高專科性的病人照護單位工作。 B. Staff nurses have the opportunity to work in highly specialized patient care unit.
12	E. Manager who backs up staff in decision making, even in conflict with MD. C.即使護理人員的決定和醫生發生衝突，護理長也會支持護理人員。 B. Head nurse backs up staff nurses' decisions even they are in conflict with doctors.
13	E. Physicians and department or unit staff have good relationships. C.醫師們和本單位之間有良好的工作關係。 B. There are good working relationships between doctors and this unit.

Note. E = Original English version; C = Translated-Adapted Chinese version;
B = Back-translated English version

Table 10 (continued)

Item	Contents
14	E. Not being placed in a position of having to do things against my professional judgment. C.我沒有被放在必須違背自己專業判斷做事的處境。 B. I have never been placed in a position of having to do things against my professional judgment.
15	E. I get information on patient's status when I need it. C.當我需要病人狀況的相關資訊時，我就能得到。 B. I get information of patient's status when I need it.
16	E. When patient's status changes, I get relevant information quickly. C.當病人的情況改變時，我能迅速得到相關的資訊。 B. When patient's status changes, I get relevant information quickly.
17	E. This unit has construct relationships with other groups in this hospital. C.本單位與醫院中其他的團隊間具有良好的工作關係。 B. This unit has good working relationships with other groups in this hospital.
18	E. This unit doesn't get cooperation it needs from other hospital units. C.本單位沒有從醫院中其他的單位獲得所需的合作。 B. This unit does not get cooperation that it needs from other hospital units.
19	E. Other hospital units seem to have low opinion of this unit. C.醫院中其他的單位似乎對本單位的評價不高。 B. Other hospital units seem to have a low opinion of this unit.
20	E. Inadequate working relationships with other hospital groups limit effectiveness of work on this unit. C.和醫院中其他的團隊的不良工作關係，限制了本單位的工作效益。 B. Inadequate working relationship with other hospital groups limits the effectiveness of work in this unit.

Note. E = Original English version; C = Translated-Adapted Chinese version;
B = Back-translated English version

Table 10 (continued)

Item	Contents
21	E. When staff disagree, they ignore issue, pretending it will go away. C.當護理人員意見不合時，他們會忽略問題，假裝問題將會消失不見。 B. When staff nurses disagree, they ignore the problem and pretend that the problem will go away.
22	E. Staff withdraw from conflict. C.護理人員會從衝突中退出。 B. Staff nurses withdraw from conflict.
23	E. All points of view considered in finding best solution to problem. C.在尋找問題的最佳解決方法時，所有的觀點都有被考慮。 B. All points of views are considered in finding best solution to problems.
24	E. All staff work hard to arrive at best possible solution. C.所有護理人員都努力去達到最佳的可能解決方法。 B. All staff nurses work hard to reach the best possible solution.
25	E Staff involved don't settle dispute until all are satisfied with decision. C.直到大家對決議感到滿意，相關的護理人員才會平息紛爭。 B. The staff nurses involved do not settle argument until they are all satisfied with the decision.
26	E. All contribute from their experience, expertise to effect high quality solution. C.護理人員的經驗和專業知識對達成高品質的解決方法有所貢獻。 B. The experience and professional knowledge of staff nurses have contribution to achieve the high quality problem-solving approach.
27	E. Disagreements between staff are ignored or avoided. C.護理人員之間的爭論會被忽略或被避免。 B. Disagreements between staff nurses are ignored or avoided.

Note. E = Original English version; C = Translated-Adapted Chinese version;
B = Back-translated English version

Table 10 (continued)

Item	Contents
28	E. Staff involve settle dispute by consensus.
	C.相關的護理人員以達成共識的方法來平息紛爭。
	B. The staff nurses involved settle the argument by consensus.
29	E. My opinion of myself goes up when I work on this unit.
	C.當我在這個單位工作時，我對自我的評價提升了。
	B. My self-appraisal goes up when I work in this unit.
30	E. I feel a great sense of personal satisfaction when I do this job well.
	C.當我把工作做好時，我覺得有很大的自我滿足感。
	B. I feel highly satisfied when I do the job well.
31	E. I feel a high degree of personal responsibility for the work I do.
	C.我對自己所作的工作感到有高度的自我責任感。
	B. I feel highly responsible for the work I do.
32	E. I have challenge work that motivates me to do best job I can.
	C.我有挑戰性的工作來激勵自己將工作做到最好。
	B. I have challenging work to motivate me to do the best job.
33	E. Working on this unit gives me the opportunity to gain new knowledge and skills.
	C.在這個單位工作，讓我有機會獲得新的知識和技巧。
	B. Working in this unit gives me opportunity to gain new knowledge and skills.
34	E. I am motivated to do well because I am empowered by my work environment.
	C.因爲我的工作環境激勵我，使我有動機將工作做好。
	B. I am motivated to do the best job because I am empowered by my work environment.

Note. E = Original English version; C = Translated-Adapted Chinese version;
B = Back-translated English version

Table 10 (continued)

Item	Contents
35	E. Working in this environment increase my sense of professional growth. C.在這個環境工作，增強了我專業成長的感覺。 B. Working in this environment increases my feeling of professional growth.
36	E. Staff have access to necessary resources to provide culturally competent care. C.護理人員能獲得必須的資源，以提供顧及個案文化的合適照護。 B. Staff nurses can obtain the necessary resources to give appropriate care that can meet patient's cultural needs.
37	E. Staff are sensitive to diverse patient populations when they serve. C.護理人員對他們所服務的各式各樣病人族群是感受敏銳的。 B. Staff nurses are sensitive to that the patient populations whom they serve are diverse.
38	E. Staff are respectful of their department or unit's diverse health care team. C.護理人員尊重其單位中多樣化的健康照護小組。 B. Staff nurses respect their unit's diverse health care teams.

Note. E = Original English version; C = Translated-Adapted Chinese version;
B = Back-translated English version

Revisions of Instruments

In order to pursue a quality translation this study had taken almost 1 and half years to translate and adapt the original English version of the PPE Scale into Chinese. However, during that period, the original PPE Scale was revised by the tool developers at MGH for use as an electronic version. In the process, items were carefully reviewed and revised to increase the clarity of the statements. For example, where the subject being

referred to was unclear, e.g. the leader on your unit, language was changed to indicate that leader should refer to nurse director or manager. The tool developers at MGH reworded some items to increase the clarity of the items but the contents and concepts of the original PPE Scale remained the same in the revised PPE version (see Table 11).

Table 11

Original PPE Scale and the Revised PPE Scale

Item	Contents
1	E. Leadership supportive to department or unit staff.
	E-r. Leadership is supportive of nursing.
2	E. My discipline controls its own practice.
	E-r. Nursing controls its own practice on my unit.
3	E. Freedom to make important patient care and work decisions.
	E-r. I have freedom to make important patient care and work decisions.
4	E. A lot of teamwork between physicians and staff.
	E-r. There is a lot of teamwork between nurses and doctors.
5	E. Patient care assignments that foster continuity of care.
	E-r. On my unit, patient care assignments foster continuity of care.
6	E. Adequate support services allow me to spend time with patients.
	E-r. I have adequate support services to allow me to spend time with my patients.
7	E. Enough time and opportunity to discuss patient care problems with other staff.
	E-r. I have enough time and opportunity to discuss patient care problems with other nurses.
8	E. Enough staff to provide quality patient care.
	E-r. On my unit, there are enough nurses on staff to provide quality patient care.
9	E. A manager who is a good manager and leader.
	E-r. The nurse manager on my unit is a good manager and leader.

Note. E = Original English version; E-r = Revised English version

Table 11 (continued)

Item	Contents
10	E. Enough staff to get the work done.
	E-r. We have enough staff to get the work done.
11	E. Opportunity to work on highly specialized patient care unit.
	E-r. There are opportunities to work on a highly specialized patient care unit.
12	E. Manager who backs up staff in decision making, even in conflict with MD.
	E-r. My nurse manager supports the nursing staff in decision-making, even if the conflict is with a doctor.
13	E. Physicians and department or unit staff have good relationships.
	E-r. Physicians and nurses have good working relationships.
14	E. Not being placed in a position of having to do things against my professional judgment.
	E-r. On my unit, I am asked to do things against my professional judgment.
15	E. I get information on patient's status when I need it.
	E-r. Information on the status of patients is available when I need it.
16	E. When patient's status changes, I get relevant information quickly.
	E-r. I receive information quickly when a patient's status changes.
17	E. This unit has construct relationships with other groups in this hospital.
	E-r. My unit has constructive work relationships with other hospital units.
18	E. This unit doesn't get cooperation it needs from other hospital units.
	E-r. My unit does not receive the cooperation it needs from other hospital units.
19	E. Other hospital units seem to have low opinion of this unit.
	E-r. Other hospital units seem to have a low opinion of my primary unit.

Note. E = Original English version; E-r = Revised English version

Table 11 (continued)

Item	Contents
20	E. Inadequate working relationships with other hospital groups limit effectiveness of work on this unit.
	E-r. Inadequate working relationships with other hospital units limit the effectiveness of work within my primary unit.
21	E. When staff disagree, they ignore issue, pretending it will go away.
	E-r. When staff on my unit disagree, they ignore the issue, pretending it will ″go away.”
22	E. Staff withdraw from conflict.
	E-r. Staff on my unit withdraw from conflict.
23	E. All points of view considered in finding best solution to problem.
	E-r. On my unit, all points of view are carefully considered in arriving at the best solution for the problem.
24	E. All staff work hard to arrive at best possible solution.
	E-r. All staff on my unit work hard to arrive at the best possible solution.
25	E Staff involved don’t settle dispute until all are satisfied with decision.
	E-r. On my unit, staff involved in a disagreement or conflict do not settle the dispute until all are satisfied with the decision.
26	E. All contribute from their experience, expertise to effect high quality solution.
	E-r. Everyone on my unit contributes from their experience and expertise to produce a high quality solution for a conflict.
27	E. Disagreements between staff are ignored or avoided.
	E-r. On my unit, disagreements between staff are ignored or avoided.
28	E. Staff involve settle dispute by consensus.
	E-r. Staff involved in a disagreement or conflict settle the dispute by consensus.

Note. E = Original English version; E-r = Revised English version

Table 11 (continued)

Item	Contents
29	E. My opinion of myself goes up when I work on this unit.
	E-r. My opinion of myself goes up when I work on my primary unit.
30	E. I feel a great sense of personal satisfaction when I do this job well.
	E-r. I feel a high degree of personal responsibility for the work I do.
31	E. I feel a high degree of personal responsibility for the work I do.
	E-r. I feel a great sense of personal satisfaction when I do my work well.
32	E. I have challenge work that motivates me to do best job I can.
	E-r. I have challenging work that motivates me to do the best I can.
33	E. Working on this unit gives me the opportunity to gain new knowledge and skills.
	E-r. Working on my primary unit gives me the opportunity to gain new knowledge and skills.
34	E. I am motivated to do well because I am empowered by my work environment.
	E-r. I am motivated to do well because I am empowered by my work environment.
35	E. Working in this environment increase my sense of professional growth.
	E-r. Working in this environment increases my sense of professional growth.
36	E. Staff have access to necessary resources to provide culturally competent care.
	E-r. Staff on my unit have access to the necessary resources to provide culturally-competent care.
37	E. Staff are sensitive to diverse patient populations when they serve.
	E-r. Staff on my unit are sensitive to the diverse patient population for whom they care.
38	E. Staff are respectful of their department or unit's diverse health care team.
	E-r. Staff respect the diversity of their unit's health care team.

Note. E = Original English version; E-r = Revised English version

After the discussion with one of the tool developers for the PPE Scale, since the meaning of the revised version of the English PPE Scale was same as the original scale except for some different wordings on the revised version, the translated-adapted of the Chinese version of the PPE Scale update was decided to be revised according to the revised version of the English PPE Scale. The researcher carefully read each of the 38 items on the revised PPE version and revised the drafts of the translated-adapted Chinese version of the PPE Scale and the back-translated English version of the PPE Scale. The revised scale is presented in Table 12.

Table 12
The Revised Translated-Adapted Chinese Version of the PPE Scale and the Revised Back-Translated Elglish Version of the PPE Scale

Item	Contents
1	E-r. Leadership is supportive of nursing.
	C-r. 領導階層支持護理。
	B-r. Leadership supports nursing
2	E-r. Nursing controls its own practice on my unit.
	C-r. 在本單位裏,護理掌控了自己的專業實務。
	B-r. In this unit, nursing controls its own professional practice.
3	E-r. I have freedom to make important patient care and work decisions.
	C-r. 我具有對病人照護和工作做重要決策的自由。
	B-r. I have freedom to make important patient care and work decisions.
4	E-r. There is a lot of teamwork between nurses and doctors.
	C-r. 醫師和護理人員之間有很多團隊合作。
	B-r. There is a lot of teamwork between staff nurses and doctors.

Note. E-r = Revised Original English version; C-r = Revised Translated-Adapted Chinese version; B-r = Revised Back-translated English version

Table 12 (continued)

Item	Contents
5	E-r. On my unit, patient care assignments foster continuity of care. C-r. 在本單位裏，病人照護的工作分派促進了照護的連續性。 B-r. In this unit, patient care assignments facilitate the continuity of patient care.
6	E-r. I have adequate support services to allow me to spend time with my patients. C-r. 本院有足夠的支持性服務(例如：社會服務部門、轉送中心、醫事部門…等)，使我能將時間放在病人身上。 B-r. This hospital has enough support services such as social services department, transferring center, medical affairs division, etc. to allow me to spend time with patients.
7	E-r. I have enough time and opportunity to discuss patient care problems with other nurses. C-r. 我有足夠的時間和機會與其他的醫療人員討論照護病人的問題。 B-r. I have sufficient time and opportunity to discuss patient care problems with other staff.
8	E-r. On my unit, there are enough nurses on staff to provide quality patient care. C-r. 本單位有足夠的護理人員來提供具有品質的病人照護。 B-r. This unit has enough staff nurses to provide quality patient care.
9	E-r. The nurse manager on my unit is a good manager and leader. C-r. 本單位的護理長是一個好的管理者和領導者。 B-r. Head nurse in this unit is a good manager and leader.

Note. E-r = Revised Original English version; C-r = Revised Translated-Adapted Chinese version; B-r = Revised Back-translated English version

Table 12 (continued)

Item	Contents
10	E-r. We have enough staff to get the work done. C-r. 本單位有足夠的護理人員來完成病人照護工作。 B-r. This unit has enough staff nurses to get the patient care work done.
11	E-r. There are opportunities to work on a highly specialized patient care unit. C-r. 護理人員有機會在高專科性的病人照護單位工作。 B-r. Staff nurses have the opportunity to work in highly specialized patient care unit.
12	E-r. My nurse manager supports the nursing staff in decision-making, even if the conflict is with a doctor. C-r. 即使護理人員的決定和醫生發生衝突，本單位的護理長也會支持護理人員。 B-r. Head nurse in this unit backs up staff nurses' decisions even they are in conflict with doctors.
13	E-r. Physicians and nurses have good working relationships. C-r. 醫師和本單位護理人員之間有良好的工作關係。 B-r. There are good working relationships between doctors and this unit.
14	E-r. On my unit, I am asked to do things against my professional judgment. C-r. 在本單位裏,我被要求違背自己專業判斷來做事。 B-r. In this unit, I am asked to do things against my professional judgment.
15	E-r. Information on the status of patients is available when I need it. C-r. 當我需要病人狀況的相關資訊時，我就能得到。 B-r. I get information about patient's status when I need it.
16	E-r. I receive information quickly when a patient's status changes. C-r. 當病人的情況改變時，我能迅速得到相關的資訊。 B-r. When patient's status changes, I get relevant information quickly.

Note. E-r = Revised Original English version; C-r = Revised Translated-Adapted Chinese version; B-r = Revised Back-translated English version

T able 12 (continued)

Item	Contents
17	E-r. My unit has constructive work relationships with other hospital units.
	C-r. 本單位與醫院中其他的團隊間具有良好的工作關係。
	B-r. This unit has good working relationships with other groups in this hospital.
18	E-r. My unit does not receive the cooperation it needs from other hospital units.
	C-r. 本單位沒有從醫院中其他的單位獲得所需的合作。
	B-r. This unit does not get the cooperation that it needs from other hospital units.
19	E-r. Other hospital units seem to have a low opinion of my primary unit.
	C-r. 醫院中其他的單位似乎對本單位的評價不高。
	B-r. Other hospital units seem to have a low opinion of this unit.
20	E-r. Inadequate working relationships with other hospital units limit the effectiveness of work within my primary unit.
	C-r. 和醫院中其他的團隊的不良工作關係，限制了本單位的工作效益。
	B-r. Inadequate working relationship with other hospital groups limits the effectiveness of work in this unit.
21	E-r. When staff on my unit disagree, they ignore the issue, pretending it will ″go away.”
	C-r. 本單位的護理人員意見不合時，他們會忽略問題，假裝問題將會消失不見。
	B-r. When staff nurses in this unit disagree, they ignore the problem and pretend that the problem will go away.
22	E-r. Staff on my unit withdraw from conflict.
	C-r. 本單位的護理人員會從衝突中退出。
	B-r. Staff nurses in this unit withdraw from conflict.

Note. E-r = Revised Original English version; C-r = Revised Translated-Adapted Chinese version; B-r = Revised Back-translated English version

T able 12 (continued)

Item	Contents
23	E-r. On my unit, all points of view are carefully considered in arriving at the best solution for the problem.
	C-r. 在本單位裏，在尋找問題的最佳解決方法時，所有的觀點都有被考慮。
	B-r. In this unit, all points of views are considered in finding best solution to problems.
24	E-r. All staff on my unit work hard to arrive at the best possible solution.
	C-r. 本單位的所有護理人員都努力去達到最佳的可能解決方法。
	B-r. All staff nurses in this unit work hard to reach the best possible solution.
25	E-r. On my unit, staff involved in a disagreement or conflict do not settle the dispute until all are satisfied with the decision.
	C-r. 在本單位裏，直到大家對決議感到滿意，涉及意見不和或衝突的相關護理人員才會平息紛爭。
	B-r. In this unit, the staff nurses involved do not settle disagreement until they are all satisfied with the decision.
26	E-r. Everyone on my unit contributes from their experience and expertise to produce a high quality solution for a conflict.
	C-r. 本單位護理人員的經驗和專業知識，對達成高品質的衝突解決方法有所貢獻。
	B-r. The experience and professional knowledge of staff nurses in this unit contribute to achieve the high quality solution.
27	E-r. On my unit, disagreements between staff are ignored or avoided.
	C-r. 在本單位裏，護理人員之間的爭論會被忽略或被避免。
	B-r. In this unit, disagreements between staff nurses are ignored or avoided.
28	E-r. Staff involved in a disagreement or conflict settle the dispute by consensus.
	C-r. 涉及意見不和或衝突的相關護理人員，以達成共識的方法來平息紛爭。
	B-r. The staff nurses involved settle the disagreement by consensus.

Note. E-r = Revised Original English version; C-r = Revised Translated-Adapted Chinese version; B-r = Revised Back-translated English version

Table 12 (continued)

Item	Contents
29	E-r. My opinion of myself goes up when I work on my primary unit.
	C-r. 當我在這個單位工作時，我對自我的評價提升了。
	B-r. My self-appraisal goes up when I work in this unit.
30	E-r. I feel a high degree of personal responsibility for the work I do.
	C-r. 當我把工作做好時，我覺得有很大的自我滿足感。
	B-r. I feel a great sense of personal satisfaction when I do the job well.
31	E-r. I feel a great sense of personal satisfaction when I do my work well.
	C-r. 我對自己所作的工作感到有高度的自我責任感。
	B-r. I feel a high degree of personal responsibility for the work I do.
32	E-r. I have challenging work that motivates me to do the best I can.
	C-r. 我擁有挑戰性的工作，激勵自己將工作做到最好。
	B-r. I have challenging work to motivate me to do the best job.
33	E-r. Working on my primary unit gives me the opportunity to gain new knowledge and skills.
	C-r. 在這個單位工作，讓我有機會獲得新的知識和技巧。
	B-r. Working in this unit gives me opportunity to gain new knowledge and skills.
34	E-r. I am motivated to do well because I am empowered by my work environment.
	C-r. 因爲我的工作環境激勵我，使我有動機將工作做好。
	B-r. I am motivated to do the best job because I am empowered by my work environment.
35	E-r. Working in this environment increases my sense of professional growth.
	C-r. 在這個環境工作，增強了我專業成長的感覺。
	B-r. Working in this environment increases my feeling of professional growth.

Note. E-r = Revised Original English version; C-r = Revised Translated-Adapted Chinese version; B-r = Revised Back-translated English version

Table 12 (continued)

Item	Contents
36	E-r. Staff on my unit have access to the necessary resources to provide culturally-competent care. C-r. 本單位的護理人員能獲得必須的資源，以提供顧及個案文化的合適照護。 B-r. Staff nurses in this unit can obtain the necessary resources to give appropriate care that is sensitive to patient's culture.
37	E-r. Staff on my unit are sensitive to the diverse patient population for whom they care. C-r. 本單位的護理人員對他們所服務的各式各樣病人族群是感受敏銳的。 B-r. Staff nurses in this unit are sensitive to the diverse patient populations whom they serve.
38	E-r. Staff respect the diversity of their unit's health care team. C-r. 護理人員尊重其單位中多樣化的健康照護小組。 B-r. Staff nurses respect their unit's diverse health care teams.

Note. E-r = Revised Original English version; C-r = Revised Translated-Adapted Chinese version; B-r = Revised Back-translated English version

Empirical Testing for Semantic Equivalence after Translation

Before moving to the Stage II of this study to validate the content of the translated-adapted Chinese version of the PPE Scale, empirically testing the original English version of the PPE Scale along with the translated-adapted Chinese version of the PPE Scale and the back-translated English version of the PPE Scale within two groups of nurses was planned to be constructed. However, because of the difficulty in recruiting the relevant samples, the empirical tests were forced to delay. Due to the delay, when the empirical testing for semantic equivalence started to be constructed, a revised English version of the PPE Scale had already been produced and the translated-adapted Chinese

version of the PPE Scale and the back-translated version of the PPE Scale had already been revised based on the revised English version of the PPE Scale. The researcher initially tested the original English version of the PPE Scale, translated-adapted Chinese version of the PPE Scale, and the revised English version of the PPE Scale in a bilingual Taiwanese nurse. The bilingual nurse noted that the original PPE Scale was not easy to fill out because some items did not have clear subject to for the respondent to refer to. The nurse indicated that the lack of clear subject in some items of the original PPE Scale led to her different response on a same item with a clear subject in the Chinese version. This preliminary investigation raised the concern about the research bias. After the discussion with one of the tool developers for the PPE Scale, the revised English version of the PPE Scale along with the revised translated-adapted Chinese version of the PPE Scale and the revised back-translated version of the PPE Scale (see Table 12) were decided to be used for empirically testing the semantic equivalence. The two empirical testing results are presented as below.

Semantic Equivalence between the Revised English Version of the PPE scale and the Revised Back-Translated English Version of the PPE Scale from Monolingual Nurse

To empirically test the semantic equivalence between the revised English version of the PPE Scale and the revised back-translated English version of the PPE Scale, 14 American nurses working in acute care settings were recruited in this study using snowball method. These nurses were asked to fill out the two forms of surveys at a 7-day interval. Four nurses were excluded because they did not reply to the second survey.

Finally, the two survey data at a 2-week interval from 10 American nurses were used for analyses. Paired *t* tests, Pearson correlation, Intra-class Correlation Coefficients (ICC), and percentage of consistency were computed to evaluate the semantic equivalence between the original English version of the PPE Scale and the back-translated English version of the PPE Scale. Because 39 pairwise comparisons were performed to test the difference between the scores of the 38 items and the total scale at the 7-day interval, Bonferroni correction was used to prevent the chance of Type I error (Munro, 2006), thus, a *p* value of .001 was consider as significant.

As shown in Table 13, the Pearson correlation coefficient ranged from .07 (Item 18,21) to 1 (Item 4, 19, 31, 32, 34, and 38) and was .97 for the total scale. The ICC (2,1) was .96 for the total scale and ranged from .06 (Item 21) to 1 (Item 4, 19, 31, 32, 34, and 38). The average percentage of consistency between the scores for the total scale at the 7-day interval was 76.32% and ranged from 40% (Item 5) to 100 % (Item 4, 19, 31, 32, 34, and 38). Only the scores of 6 items (Item 4, 19, 31, 32, 34, and 38) at the 7-day interval showed perfect Pearson correlation ($r > .07$, $p < .001$), Intra-class Correlation Coefficients (ICC value = 1), and consistency (consistency =100%). Although most of the scores of the 38 items at the 7-day interval did not showed satisfactory Pearson correlation ($r < .7$, $p > .001$), Intra-class Correlation Coefficients (ICC value <.07), or consistency (consistency <100%), Paired *t* test results indicated that there was no significant difference between the scores of each of the 38 items and the score for the 38-item total scale at the 7-day interval. The Paired *t* test results supported the semantic

equivalence between the revised English version of the PPE scale and the revised back-translated English version of the PPE Scale.

Table 13

Equivalence between the Revised English Version of the PPE Scale and the Revised Back-Translated English Version of the PPE Scale (N=10)

Item/version	n	*M*	*SD*	*t*	*r*	ICC $_{(2,1)}$	Consistency
1	10						
E-r		3.60	0.52	1.00	0.49	0.47	60
B-r		3.40	0.70				
2	10						
E-r		3.10	0.32	-0.56	0.44	0.37	70
B-r		3.20	0.63				
3	10						
E-r		3.30	0.48	-2.45	0.43	0.33	60
B-r		3.70	0.48				
4	10						
E-r		3.30	0.48			1.00	100
B-r		3.30	0.48				
5	10						
E-r		2.90	0.57	-1.81	0.38	0.33	40
B-r		3.30	0.67				
6	10						
E-r		3.00	0.47	-0.56	0.42	0.43	70
B-r		3.10	0.57				
7	10						
E-r		3.20	0.63	0.36	0.36	0.36	60
B-r		3.10	0.88				

Note. E-r = Revised English version; B-r = Revised Back-translated English version

Table 13 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC (2,1)	Consistency
8	10						
E-r		3.20	0.63	-2.45	0.61	0.50	60
B-r		3.60	0.52				
9	10						
E-r		3.60	0.70	1.50	0.87*	0.84	80
B-r		3.40	0.84				
10	10						
E-r		3.30	0.48	0.36	0.35	0.31	60
B-r		3.20	0.92				
11	10						
E-r		3.60	0.52	-1.00	0.80	0.80	90
B-r		3.70	0.48				
12	10						
E-r		3.50	0.71	1.00	0.90*	0.90	90
B-r		3.40	0.70				
13	10						
E-r		3.30	0.48	-1.50	0.65	0.63	80
B-r		3.50	0.53				
14	10						
E-r		3.20	0.92	-1.50	0.89*	0.87	80
B-r		3.40	0.84				
15	10						
E-r		3.50	0.53		0.60	0.63	80
B-r		3.50	0.53				

Note. E-r = Revised English version; B-r = Revised Back-translated English version;
*p< .001

Table 13 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC (2,1)	Consistency
16	10						
E-r		3.50	0.53		0.60	0.63	80
B-r		3.50	0.53				
17	10						
E-r		3.20	0.63	-1.96	0.75	0.69	70
B-r		3.50	0.71				
18	10						
E-r		2.80	0.79	-1.18	0.07	0.07	60
B-r		3.20	0.79				
19	10						
E-r		3.20	0.92			1.00	100
B-r		3.20	0.92				
20	10						
E-r		3.40	0.52	0.82	0.12	0.09	50
B-r		3.10	1.10				
21	10						
E-r		2.90	0.88	-1.46	0.07	0.06	50
B-r		3.40	0.70				
22	10						
E-r		2.80	0.63	-0.56	0.67	0.68	70
B-r		2.90	0.74				
23	10						
E-r		3.50	0.53	-1.00	0.82	0.82	60
B-r		3.60	0.52				

Note. E-r = Revised English version; B-r = Revised Back-translated English version

Table 13 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC (2,1)	Consistency
24	10						
E-r		3.50	0.53	-1.00	0.82	0.82	90
B-r		3.60	0.52				
25	10						
E-r		3.20	0.63	0.80	0.26	0.27	80
B-r		3.00	0.67				
26	10						
E-r		3.50	0.53	-1.50	0.65	0.63	70
B-r		3.70	0.48				
27	10						
E-r		3.30	0.48	0.56	0.51	0.51	60
B-r		3.20	0.63				
28	10						
E-r		3.00	0.47		0.58	0.53	60
B-r		3.00	0.82				
29	10						
E-r		3.30	0.67	-2.24	0.23	0.16	90
B-r		3.80	0.42				
30	10						
E-r		3.80	0.42	1.00	0.76	0.76	90
B-r		3.70	0.48				
31	10						
E-r		3.80	0.42			1.00	100
B-r		3.80	0.42				

Note. E-r = Revised English version; B-r = Revised Back-translated English version

Table 13(continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC (2,1)	Consistency
32	10						
E-r		3.70	0.67			1.00	100
B-r		3.70	0.67				
33	10						
E-r		3.70	0.48	-1.00	0.76	0.76	90
B-r		3.80	0.42				
34	10						
E-r		3.60	0.70			1.00	100
B-r		3.60	0.70				
35	10						
E-r		3.80	0.42	1.00	0.76	0.76	90
B-r		3.70	0.48				
36	10						
E-r		3.60	0.52		0.58	0.61	80
B-r		3.60	0.52				
37	10						
E-r		3.60	0.52	-1.50	0.61	0.57	80
B-r		3.80	0.42				
38	10						
E-r		3.70	0.48			1.00	100
B-r		3.70	0.48				
Total	10						
E-r		3.37	0.34	-2.16	0.97*	0.96	76.32
B-r		3.44	0.40				

Note. E-r = Revised English version; B-r = Revised Back-translated English version;
* $p < .001$

Semantic Equivalence between the Revised English Version of the PPE scale and the Revised Translated-Adapted Chinese Version of the PPE Scale from Bilingual Nurses

By using snowball method, 35 Taiwanese nurses working in acute care settings were recruited in this study to serve as bilingual participants to empirically test the semantic equivalence between the revised English version of the PPE Scale and the revised translated-adapted Chinese version of the PPE Scale. All these 35 nurses were asked to fill out the two forms of surveys in the same time. To prevent memory recall bias, the nurses were asked to fill out the revised English version of the PPE Scale, demographic data, and the revised translated-adapted Chinese version of the PPE Scale in order. The two survey data from these 35 nurses were used for analyses.

To evaluate the semantic equivalence between the original English version of the PPE Scale and the translated-adapted Chinese version of the PPE Scale, Paired *t* tests, Pearson correlation, Intra-class Correlation Coefficients (ICC), and percentage of consistency were computed. The Bonferroni correction was performed to prevent the chance of Type I error (Munro, 2006). Because 39 pairwise comparisons were calculated using Paired *t* test to test the difference between the scores of the 38 items on the two forms, a *p* value of .001 was considered significant. As shown in Table 14, the Pearson correlation coefficient between the two versions was .93 for the total score of the 38 items and ranged from .07 (Item 24) to .93 (Item 35). The ICC (2,1) between the two versions was .93 for the total scale of the 38 items and ranged from .06 (Item 24) to .93 (Item 35). The average percentage of consistency between the two versions was 73.53%

for the score of the total scale and ranged from 42.86% (Item 24) to 97.14 % (Item 35). Although most of the scores of the 38 items at the 7-day interval did not showed satisfactory Pearson correlation (r <.7, p >.001), Intra-class Correlation Coefficients (ICC value <.07), or consistency (consistency <100%), Paired t test results indicated that there was no significant difference on the scores of each of the 38 items and the score for the 38-item total scale between the two versions (p > .001). The Paired t test results supported the semantic equivalence between the revised English version of the PPE scale and the revised translated-adapted Chinese version of the PPE Scale.

Table 14

Semantic Equivalence between the Revised English Version of the PPE Scale and the Revised Translated-Adapted Chinese Version of the PPE Scale (N=35)

Item/version	n	*M*	*SD*	*t*	*r*	ICC $_{(2,1)}$	Consistency
1	35						
E-r		3.03	0.57	2.09	0.37	0.35	62.86
C-r		2.80	0.58				
2	35						
E-r		2.69	0.53	-1.54	0.31	0.28	68.57
C-r		2.83	0.38				
3	35						
E-r		2.91	0.51	1.14	0.53*	0.51	80.00
C-r		2.83	0.38				

Note. E-r = Revised English version; C-r = Revised Translated-Adapted Chinese version; *p<.001

Table 14 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC $_{(2,1)}$	Consistency
4	35						
E-r		3.09	0.51	2.65	0.67*	0.53	82.86
C-r		2.91	0.28				
5	35						
E-r		2.97	0.38	0.81	0.25	0.24	82.86
C-r		2.91	0.28				
6	35						
E-r		2.46	0.70	-2.17	0.41	0.38	45.71
C-r		2.71	0.57				
T7	35						
E-r		2.46	0.61	-1.16	0.47	0.46	74.29
C-r		2.57	0.50				
8	35						
E-r		2.06	0.59	-3.01	0.57*	0.50	68.57
C-r		2.31	0.47				
9	35						
E-r		2.80	0.63	0.63	0.60*	0.60	71.43
C-r		2.74	0.56				
10	35						
E-r		2.09	0.56	-1.97	0.58*	0.56	71.43
C-r		2.26	0.56				
11	35						
E-r		2.94	0.54	0.30	0.27	0.26	68.57
C-r		2.91	0.37				

Note. E-r = Revised English version; C-r = Revised Translated-Adapted Chinese version;
*p<.001

Table 14 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC $_{(2,1)}$	Consistency
12	35						
E-r		2.69	0.58	1.67	0.75*	0.74	82.86
C-r		2.57	0.56				
13	35						
E-r		2.80	0.58	-1.28	0.43	0.33	80.00
C-r		2.91	0.28				
14	35						
E-r		2.77	0.84	-0.85	0.40	0.36	45.71
C-r		2.89	0.53				
15	35						
E-r		2.94	0.42	0.33	0.31	0.30	77.14
C-r		2.83	0.38				
16	35						
E-r		2.94	0.42	0.57	0.70*	0.66	91.43
C-r		2.91	0.28				
17	35						
E-r		2.71	0.52	-2.65	0.68*	0.57	82.86
C-r		2.89	0.32				
18	35						
E-r		2.89	0.47	1.16	0.16	0.16	65.71
C-r		2.77	0.43				
19	35						
E-r		2.83	0.51	1.97	0.47	0.45	71.43
C-r		2.66	0.48				

Note. E-r = Revised English version; C-r = Revised Translated-Adapted Chinese version;
*$p<.001$

Table 14 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC $_{(2,1)}$	Consistency
20	35						
E-r		2.37	0.49	1.00	0.43	0.43	74.29
C-r		2.29	0.46				
21	35						
E-r		2.80	0.83	1.22	0.56*	0.48	51.43
C-r		2.66	0.48				
22	35						
E-r		2.51	0.51	0.33	0.49	0.49	74.29
C-r		2.49	0.51				
23	35						
E-r		2.80	0.47	-0.44	0.62*	0.61	85.71
C-r		2.83	0.38				
24	35						
E-r		2.51	0.61	-1.85	0.07	0.06	42.86
C-r		2.74	0.44				
25	35						
E-r		2.49	0.51	-1.28	0.44	0.44	71.43
C-r		2.60	0.50				
26	35						
E-r		2.91	0.28	1.36	0.40	0.38	85.71
C-r		2.83	0.38				
27	35						
E-r		2.51	0.56	-0.30	0.44	0.47	68.57
C-r		2.54	0.51				

Note. E-r = Revised English version; C-r = Revised Translated-Adapted Chinese version;
*$p<.001$

Table 14 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC $_{(2,1)}$	Consistency
28	35						
E-r		2.71	0.57	-0.77	0.13	0.12	57.14
C-r		2.80	0.41				
29	35						
E-r		2.91	0.28	0.63	-0.10	0.10	71.43
C-r		2.86	0.43				
30	35						
E-r		2.94	0.48	0.00	0.13	0.13	74.29
C-r		2.94	0.42				
31	35						
E-r		3.09	0.51	1.00	0.76*	0.75	88.57
C-r		3.03	0.45				
32	35						
E-r		3.00	0.49	2.47	0.37	0.34	65.71
C-r		2.77	0.49				
33	35						
E-r		2.94	0.54	1.79	0.85*	0.84	91.43
C-r		2.86	0.49				
34	35						
E-r		2.71	0.52	-0.90	0.43	0.43	77.14
C-r		2.80	0.53				
35	35						
E-r		2.83	0.45	-1.00	0.93*	0.93	97.14
C-r		2.86	0.43				

Note. E-r = Revised English version; C-r = Revised Translated-Adapted Chinese version;
*p<.001

Table 14 (continued)

Item/version	n	*M*	*SD*	*t*	*r*	ICC $_{(2,1)}$	Consistency
36	35						
E-r		2.74	0.44	-1.71	0.32	0.31	74.29
C-r		2.89	0.40				
37	35						
E-r		2.91	0.37	1.36	0.51	0.51	85.71
C-r		2.83	0.38				
38	35						
E-r		2.89	0.47	0.00	0.49	0.47	82.86
C-r		2.89	0.32				
Total	35						
E-r		2.75	0.21	-0.02	.93*	0.93	73.53
C-r		2.76	0.19				

Note. E-r = Revised English version; C-r = Revised Translated-Adapted Chinese version; *p<.001

In sum, the above Paired *t* test results supported that the translated-adapted Chinese Version of the PPE Scale demonstrated satisfactory semantic equivalence as relative to the English Version of the PPE Scale.

Results of Content Equivalence from Stage II of Phase I

In Stage II of Phase I, the content equivalence of the translated-adapted Chinese items as relative to the English version of the PPE Scale was evaluated to test a part of the hypothesis for research question 1. The content validity of the translated-adapted Chinese version of the PPE Scale (see Table 10) was evaluated by a panel of Taiwanese nursing experts and a focus group of Taiwanese nursing leaders to determine its content

equivalence as relative to the English version of the PPE Scale. Two groups of content validators were asked to validate the contents of translated-adapted Chinese items by rating the relevance, representativeness, clarity, and readability of each item and the comprehensiveness of each subscale on 4-point Likert scales. By using the formula described by Lynn (1986), the percentage of agreement for each of the items receiving a rating of '3' or '4' from the content validators was computed for content validity index (CVI).

Results of Content Validity from Taiwanese Nursing Experts

Validity of the 38-item Translated-Adapted Chinese Version of the PPE Scale

A panel of 10 Taiwanese nursing experts was first asked to identify the content validity of the 38-item translated-adapted Chinese version of the PPE Scale. As show in Table 15, by using the formula described by Lynn (1986), there was no item with CVIs of relevance, representativeness, clarity, readability, or comprehensiveness less than .80. The average CVIs of relevance, representativeness, clarity, readability and comprehensiveness for the whole 38-item scale was .99, .99, .98, .99, and .96, respectively. The CVIs of relevance, representativeness, clarity, readability, and comprehensiveness for the eight subscales ranged from .88 to 1. The CVIs of relevance, representativeness, clarity, and readability for the 38 items ranged from .80 to 1. The results indicated that the 38-item translated-adapted Chinese version of the PPE Scale had satisfactory content validity. According to the Taiwanese nursing experts' responses to the comprehensiveness of the subscales on a 4-point Likert scale, where 1= items are not enough to completely present

the concept, to 4 = items are enough to completely present the concept, the results from summing the percentage of agreement for each of the items receiving a rating of '3' or '4' from the content validators showed that the indices of compresensiveness for total scale and for the 8 subscales of the 38-item translated-adapted Chinese version of the PPE Scale were greater than .80. However, using a higher standard by summing the percentage of agreement for each of the items receiving a rating of '4' to examine the compresensiveness of the scale, the results indicated that the index of compresensiveness was .67 for the total scale and ranged from .38 to .78 for the 8 subscales. Only the Internal Work Motivation subscale was rated as score 4 by all of the 10 Taiwanese experts, which meant that enough relevant items were sampled to measure the concept of Internal Work Motivation (see Table 15). Some experts suggested to adding few items in the existing subscales to better measure nurses' practice environment in Taiwan.

Table 15

Content Validity Index of the 38-Item Translated-Adapted Chinese Version of the PPE Scale from Taiwanese Nursing Experts (N=10)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness*	
					A	B
1. Handling disagreement and conflict	.98	.98	.95	.98	1	.75
21	1	1	1	1		
22	.90	.90	.90	.90		
23	1	1	1	1		
24	1	1	1	1		
25	1	1	1	1		
26	1	1	.90	1		
27	.90	.90	.80	.90		
28	1	1	1	1		
2. Internal work motivation	1	1	1	1	1	1
29	1	1	1	1		
30	1	1	1	1		
31	1	1	1	1		
32	1	1	1	1		
33	1	1	1	1		
34	1	1	1	1		
35	1	1	1	1		

Note. * Comprehensiveness A = the percentage of agreement for items rated as ‘3’ or ‘4’; Comprehensiveness B = the percentage of agreement for items rated as ‘4’

Table 15 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness*	
					A	B
3. Control over practice	1	1	.97	.97	.89	.78
5	1	1	1	1		
6	1	1	1	1		
7	1	1	1	1		
8	1	1	1	1		
10	1	1	1	1		
11	1	1	.90	.90		
14	1	1	.90	.90		
4. Leadership and autonomy in clinical practice	.98	.98	.94	.98	1	.75
1	1	1	1	1		
2	.90	.90	.80	.90		
3	1	1	.90	1		
9	1	1	1	1		
12	1	1	1	1		
5. Clinician-physician relationships	1	1	1	1	.88	.50
4	1	1	1	1		
13	1	1	1	1		

Note. * Comprehensiveness A = the percentage of agreement for items rated as ‘3’ or ‘4’; Comprehensiveness B = the percentage of agreement for items rated as ‘4’

Table 15 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness*	
					A	B
6. Communication about patients	1	1	1	1	.88	.38
15	1	1	1	1		
16	1	1	1	1		
7. Teamwork	.98	.98	1	1	1	.71
17	1	1	1	1		
18	1	1	1	1		
19	.90	.90	1	1		
20	1	1	1	1		
8. Cultural sensitivity	1	1	1	1	1	.50
36	1	1	1	1		
37	1	1	1	1		
38	1	1	1	1		
Total scale	.99	.99	.98	.99	.96	.67

Note. * Comprehensiveness A = the percentage of agreement for items rated as '3' or '4'; Comprehensiveness B = the percentage of agreement for items rated as '4'

Suggestions from Taiwanese Nursing Experts

With regard to the suggestions from the experts, five experts questioned the appropriateness of using less than three items to measure concepts such as clinician-physician relationships, communication about patients, and cultural sensitivity, so adding items into those subscales was suggested. Meanwhile, two experts noted that there were two concepts under the leadership and autonomy in clinical practice subscale and questioned that using five items might not be enough to measure the two concepts. Two items were suggested to be added into the leadership and autonomy in clinical practice subscale to increase its comprehensiveness. Moreover, one item related to nursing practice model was suggested to be added into the control over practice subscale; and two items focusing on the interaction among nurses were suggested to be added into the teamwork subscale. With regard to the compresensiveness of the total scale, two experts noted the eight subscales were not sufficient to measure the Taiwanese nursing practice environment. One expert suggested to including new items to measure the impact of the heath policies in Taiwan on nursing practice. One expert mentioned that the concept related to continuing education should be included.

Results of Adapting the Chinese PPE Scale based on Taiwanese Nursing Expert' Suggestions

Health policies could cause impacts on the clinical settings rather than being managed by the clinical setting. Since the PPE Scale was assumed to be prepared for clinical administrators to better understand and to improve the practice environment for

Taiwanese nurses, adding new items to measure the issues related to health policies could go beyond the scope of the PPE Scale. Therefore, the concept related to health policies suggested by the experts was decided not to be included.

In contrast to the concept related to health policies, the concept related to continuing education was an important issue and could be managed by the clinical settings, so the measurement of this new concept was decided to be included. Seven items related to continuing education were created by the researcher to measure a new concept called nursing professional development.

In sum, 26 new items were added in the translated-adapted Chinese version of the PPE Scale to echo Taiwanese nursing experts' opinions (see Table 16). In addition to the 7 new items (No 59 ~ 64) added to measure a new concept, nursing professional development, 19 of the 26 new items were added in the original subscale, which included one item (No 39) added in control over practice subscale; two items (No 40, 41) added in leadership and autonomy in clinical practice subscale; five items (No 42 ~ No 46) added in clinician-physician relationships; five items (No 47~ No 51) added in communication about patients subscale; two items (No 52, 53) were added in teamwork subscale; and four items (No 54 ~ 57) added in cultural sensitivity subscale. Finally, a 64-item scale was produced after the process of content validation by Taiwanese nursing experts.

Validity of the 64-item Translated-Adapted Chinese Version of the PPE Scale

These 26 added items along with the original 38 items, the definitions of the 8 subscales of the PPE Scale, and the definition of the new concept, nursing professional

development, were given back to the Taiwanese nursing experts for examining the content validity. The CVIs of relevance, representativeness, clarity, and readability for each of the 26 added items were greater than .80. As shown in Table 17, the CVIs of relevance, representativeness, clarity, and readability for the whole 64-item scale was .99, .99, .99, and .99, respectively. The CVIs of relevance, representativeness, clarity, and readability for the nine subscales ranged from .94 to 1. The CVIs of relevance, representativeness, clarity, and readability for each of the 64 items ranged from .80 to 1. According to the Taiwanese nursing experts' opinions, the results indicated that the content validity of the 64- item translated-adapted Chinese version of the PPE scale was acceptable.

Table 16

New Items Added into the Translated-Adapted Chinese Version of the PPE Scale

Subscale / Added Items
Control over practice
39 C.本單位的護理模式有助於護理人員充分發揮自己的專業能力。
B. The models of care in this unit facilitate nurses to adequately demonstrate their professional competence.
65* C.本單位醫療器材的質與量，可以滿足我照護病人所需。
B. The quality and quantity of the health care facilities in this unit meet my needs in caring patients.
Leadership and autonomy in clinical practice
40 C.在本單位裡，我對自己執行的護理實務具有掌控力。
B. In this unit, I have control over my nursing practice.
41 41 本院的行政管理者，重視基層護理人員的意見。
B. The administrators in this hospital value staff nurses' opinions.
Clinician-physician relationships
42 C.在本單位裡，醫師和護理人員互相尊重彼此的專業。
B. In this unit, doctors and nurses respect each others' profession.
43 C.在本單位裡，醫師認同護理人員對病患照護所做的貢獻。
B. In this unit, doctors recognize nurses' contributions to patient care.
44 C.在本單位裡，醫師和護理人員之間溝通良好。
B. In this unit, doctors communicate well with nurses.
45 C.在本單位裡，護理人員將病人的健康問題告知醫師時，醫師會有效率地處理問題。
B. In this unit, when nurses inform doctors about patient's health problems, doctors manage the problem effectively.
46 C.在本單位裡，醫師與護理人員一同討論病人的情況與照護事宜。
B. In this unit, doctors discuss patients' condition and care with nurses.

Note. C = Chinese version; B = Back-translated English version; * Item 65 was added in Control over practice subscale after focus group conference

Table 16 (continued)

Subscale / Added Items
Communication about patients
47 C.我可以容易地聯絡到負責照護病人的相關醫療人員。
B. I am able to easily contact the relevant medical staff in charge of the patients.
48 C.在本單位裡，病人的情況改變時，護理人員迅速通知相關的醫療人員。
B. In this unit, when the patient's condition changes, nurses quickly inform the involved medical staff in charge of the patients.
49 C.在本單位裡，護理人員充分掌握自己負責照護的病人的狀況。
B. In this unit, nurses know very well their patients' conditions
50 C.在本單位裡，護理人員之間正確且完整地交班病人的照護資訊。
B. In this unit, nurses give complete and accurate information about patients to colleagues during nursing shift report.
51 C.本院有良好的資訊系統，可以快速將病患相關資訊傳輸給負責的醫療人員。
B. This hospital has sound information systems to rapidly transfer patients' relevant information to the involved staff.
Teamwork
52 C.在本單位裡，護理人員之間具有良好的工作關係。
B. In this unit, there is a good work relationship among nurses.
53 C.在本單位裡，護理人員之間互相合作以達成工作目標。
B. In this unit, nurses help one another to achieve work goals.

Note. C = Chinese version; B = Back-translated English version

Table 16 (continued)

Subscale / Added Items
Cultural sensitivity
54 C.本院有文化議題的訓練或講座，協助護理人員瞭解不同的文化。
B. This hospital provides training or conference on cultural issues for nurses to enhance their understanding of the different cultures.
55 C.本院設有通譯服務，協助護理人員與病患溝通。
B. This hospital provides interpretation services to facilitate the communication between nurses and patients.
56 C.本院設有多語化（越南文、印尼文、泰文、英文等）的衛生保健教材，可供護理人員臨床使用。
B. This hospital provides multilingual health care brochures/sheets for nurses in clinical practice.
57 C.本單位的護理人員尊重病人的價值觀或信念。
B. Nurses in this unit respect patients' values or believes

Note. C = Chinese version; B = Back-translated English version

Table 16 (continued)

Subscale / Added Items
Nursing professional development**
58 C.本單位的新進護理人員獲得充足的職前訓練。
B. New nurses in this unit receive adequate orientation.
59 C.本單位有臨床經驗豐富的護理人員擔任輔導員，引導新進護理人員。
B. There are experienced nurses serving as preceptors to guide the new nurses in this unit.
60 C.我獲得充足的在職教育訓練。
B. I receive adequate in-service/continuous education.
61 C.本單位支持護理人員進修。
B. This unit supports nurses to returns to school for degrees.
62 C.本單位支持護理人員參與學術會議或護理專業團體活動。
B. This unit support nurses to attend conferences or professional activities.
63 C.本單位的護理人員執行研究或專案改善時，可以充份獲得必須的資源。
B. When nurses in this unit perform researches or improvement projects, they adequately get necessary resources.
64 C.本院護理圖書及期刊的質與量，可以滿足我的學習所需。
B. The quality and quantity of the collections in this hospital's library meet my learning needs.

Note. C = Chinese version; B = Back-translated English version; ** = new added concept and the relevant items

Table 17

Content Validity Index of the 64-Item Translated-Adapted Chinese Version of the PPE Scale from Taiwanese Nursing Experts (N=10)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
1. Handling disagreement and conflict	.98	.98	.95	.98	1
21	1	1	1	1	
22	.90	.90	.90	.90	
23	1	1	1	1	
24	1	1	1	1	
25	1	1	1	1	
26	1	1	1	1	
27	.90	.90	.80	.90	
28	1	1	1	1	
2. Internal work motivation	1	1	1	1	1
29	1	1	1	1	
30	1	1	1	1	
31	1	1	1	1	
32	1	1	1	1	
33	1	1	1	1	
34	1	1	1	1	
35	1	1	1	1	

Table 17 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
3. Control over practice	1	1	.98	.98	1
5	1	1	1	1	
6	1	1	1	1	
7	1	1	1	1	
8	1	1	1	1	
10	1	1	1	1	
11	1	1	.90	.90	
14	1	1	.90	.90	
39	1	1	1	1	
4. Leadership and autonomy in clinical practice	.99	.96	.96	.99	1
1	1	1	1	1	
2	.90	.90	.80	.90	
3	1	1	.90	1	
9	1	1	1	1	
12	1	1	1	1	
40	1	1	1	1	
41	1	.80	1	1	

Table 17 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
5. Clinician-physician relationships	.94	.94	1	1	1
4	1	1	1	1	
13	1	1	1	1	
42	0.8	0.8	1	1	
43	0.8	0.8	1	1	
44	1	1	1	1	
45	1	1	1	1	
46	1	1	1	1	
6. Communication about patients	1	1	1	1	1
15	1	1	1	1	
16	1	1	1	1	
47	1	1	1	1	
48	1	1	1	1	
49	1	1	1	1	
50	1	1	1	1	
51	1	1	1	1	
7. Teamwork	.99	.99	1	1	1
17	1	1	1	1	
18	1	1	1	1	
19	.90	.90	1	1	
20	1	1	1	1	
52	1	1	1	1	
53	1	1	1	1	

Table 17 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
8. Cultural sensitivity	1	1	1	1	1
36	1	1	1	1	
37	1	1	1	1	
38	1	1	1	1	
54	1	1	1	1	
55	1	1	1	1	
56	1	1	1	1	
57	1	1	1	1	
9. Professional development	1	1	1	1	1
58	1	1	1	1	
59	1	1	1	1	
60	1	1	1	1	
61	1	1	1	1	
62	1	1	1	1	
63	1	1	1	1	
64	1	1	1	1	
Total scale	.99	.99	.99	.99	1

Results of Content Validity from Taiwanese Nursing Leaders

Validity of the 64-item Translated-Adapted Chinese Version of the PPE Scale

After the 10 Taiwanese nursing experts completed the content validation for the

64-items translated-adapted Chinese version of the PPE Scale, a focus group of 5 Taiwanese Head nurses was second asked to identify the content validity of the 64 items. By computing the percentage of agreement for each of the items receiving a rating of '3' or '4', the results showed that there was no item with CVIs of relevance, representativeness, clarity, or readability less than .80. Except for Item No 38, the indices of relevance, representativeness, clarity, and readability for all of the items were 1. The average CVIs of relevance, representativeness, clarity, readability and comprehensiveness for the whole 64-item scale was .99, .99, .99, .99, .99, and 1, respectively. The CVIs of relevance, representativeness, clarity, readability, and comprehensiveness for the nine subscales ranged from .97 to 1. Again, this evaluation results indicated that the 64-item translated-adapted Chinese version of the PPE Scale had satisfactory content validity.

Suggestions from Taiwanese Nursing Leaders and Results of Adaptation

During the focus group conference, an issue related to the medical equipment supplies raised the nursing leaders' concerns. All of the members of the focus group agreed that the quality and quantity of equipment could significantly impact nursing professional practice. They suggested adding items to measure this issue. Hence, one item related to equipment issue (see Item 65 at Table 18) was decided to be added under the control over practice subscale. This added item was also validated by the members of the focus group. The CVIs of relevance, representativeness, clarity, and readability for this new added item were 1.

Validity of 65-items Translated-Adapted Chinese Version of the PPE Scale

Through the focus group conference, a 65-item translated-adapted Chinese version of the PPE Scale was produced. The evaluation results of content validity indicated that the 65-item translated-adapted Chinese version of the PPE Scale had satisfactory content validity. The CVIs of relevance, representativeness, clarity, readability and comprehensiveness for the total scale was .99, .99, .99, .99, and 1, respectively. The CVIs of relevance, representativeness, clarity, readability, and comprehensiveness for the nine subscales within the 65-item scale ranged from .97 to 1. The CVIs of relevance, representativeness, clarity, and readability for each of the items ranged from .80 to 1 (see Table 18).

Table 18

Content Validity Index of the 65-Item Translated-Adapted Chinese Version of the PPE Scale from Focus Group (N=5)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
1. Handling disagreement and conflict	1	1	1	1	1
21	1	1	1	1	
22	1	1	1	1	
23	1	1	1	1	
24	1	1	1	1	
25	1	1	1	1	
26	1	1	1	1	
27	1	1	1	1	
28	1	1	1	1	

Table 18 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
2. Internal work motivation	1	1	1	1	1
29	1	1	1	1	
30	1	1	1	1	
31	1	1	1	1	
32	1	1	1	1	
33	1	1	1	1	
34	1	1	1	1	
35	1	1	1	1	
3. Control over practice	1	1	.98	.98	1
5	1	1	1	1	
6	1	1	1	1	
7	1	1	1	1	
8	1	1	1	1	
10	1	1	1	1	
11	1	1	.90	.90	
14	1	1	.90	.90	
39	1	1	1	1	
65*	1	1	1	1	

Note. * Item 65 was the new item added after focus group conference

Table 18 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
4. Leadership and autonomy in clinical practice	1	1	1	1	1
1	1	1	1	1	
2	1	1	1	1	
3	1	1	1	1	
9	1	1	1	1	
12	1	1	1	1	
40	1	1	1	1	
41	1	1	1	1	
5. Clinician-physician relationships	1	1	1	1	1
4	1	1	1	1	
13	1	1	1	1	
42	1	1	1	1	
43	1	1	1	1	
44	1	1	1	1	
45	1	1	1	1	
46	1	1	1	1	

Table 18 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
6. Communication about patients	1	1	1	1	1
15	1	1	1	1	
16	1	1	1	1	
47	1	1	1	1	
48	1	1	1	1	
49	1	1	1	1	
50	1	1	1	1	
51	1	1	1	1	
7. Teamwork	1	1	1	1	1
17	1	1	1	1	
18	1	1	1	1	
19	1	1	1	1	
20	1	1	1	1	
52	1	1	1	1	
53	1	1	1	1	
8. Cultural sensitivity	.97	.97	.97	.97	.97
36	1	1	1	1	
37	1	1	1	1	
38	.80	.80	.80	.80	
54	1	1	1	1	
55	1	1	1	1	
56	1	1	1	1	
57	1	1	1	1	

Table 18 (continued)

Subscale / Items	Relevance	Represent-ativeness	Clarity	Readability	Comprehen-siveness
9. Professional development	1	1	1	1	1
58	1	1	1	1	
59	1	1	1	1	
60	1	1	1	1	
61	1	1	1	1	
62	1	1	1	1	
63	1	1	1	1	
64	1	1	1	1	
Total scale	.99	.99	.99	.99	1

In sum, the evaluation results indicated that through the quality translation and adaptation process, the 38-item translated-adapted Chinese version of the PPE Scale demonstrated satisfactory content validity in terms of content equivalence as relative to the English version of the PPE Scale. Through the content validation processes, 27 new items were decided to be added, thus leading to the development of the 65-item translated-adapted Chinese version of the PPE Scale.

Results of Constructing Face Validity and Pilot Testing

Preparation of the Scale for Psychometric Evaluation

Before evaluating the psychometric properties of the 65-item translated-adapted Chinese version of the PPE Scale with a large sample of Taiwanese nurses, the face

validity of the scale was decided to be preliminarily validated by five Taiwanese nurses recruited outside the study hospitals. However, around the time when the face validity of 65-item translated-adapted Chinese version of the PPE Scale started to be evaluated, a revised PPE Scale was produced. As mentioned earlier, the original PPE Scale was revised for use as an electronic version at MGH. Some items were revised to increase clarity of the statements but the content and concepts of the original PPE Scale remained the same in the revised PPE Scale. In order to keep the Chinese PPE Scale update, the translated-adapted of the Chinese version of the PPE Scale update was then decided to be revised according to the revised version of the English PPE Scale (see Table 12). Since the meaning of the revised version of the English PPE Scale was same as the original scale except for some different wordings on the revised version, the 38 items on the revised translated-adapted of the Chinese version of the PPE Scale were decided to be used for constructing psychometric properties in the future. However, two items (Item 1 and Item 14) on the revised translated-adapted of the Chinese version of the PPE Scale raised the researcher's concerns while preparing the scale for constructing the face validity.

At Stage I of Phase I in this study, the Item 1 ″Leadership supportive to department or unit staff.″ on the original PPE Scale was culturally translated and adapted as ″Head nurse supports staff nurses in the unit″. While evaluating semantic equivalence during the translation process, one of the three monolingual experts, who is also one of the developers of the PPE Scale, noted that the statement of the adapted Item 1 made the

scope of item meaning became too narrow and suggested not to adapting the item. The expert suggested to remaining Item 1 as ″Leadership supports staff nurses in the unit″. In the revised PPE Scale, the original Item 1 ″Leadership supportive to department or unit staff.″ remained its same concept and was revised as ″Leadership is supportive of nursing″. According to the revised contents, translating the Item 1 into Chinese as 領導階層支持護理 (Leadership supports nursing) might be more appropriate. However, the satisfactory CVIs rated by both of the panel of Taiwanese nursing experts and the focus group of Taiwanese nursing leaders all also supported the usability of the adapted Item 1, ″Head nurse supports staff nurses in the unit.″ In order to better help the researcher to objectively select the translated-adapted item for cross-cultural use, both of the two translated-adapted Chinese statements for Item 1 were decided to be kept for further validation, which included ″Head nurse supports staff nurses in the unit″ and ″Leadership supports nursing″. With regard to Item 14, the researcher also noted that Item 14 was revised from a negative to a positive statement in the revised PPE Scale. The original Item 14 ″ Not being placed in a position of having to do things against my professional judgment.″ was revised as ″ On my unit, I am asked to do things against my professional judgment.″ As being compared with other items, the statement of revised Item 14 seemed to be changed a lot, though its meaning remained the same. Because the original Chinese Item 14 needed to be changed a lot based on the revised PPE Scale, the researcher started to concern about the clarity of the revised Chinese Item 14 which was not validated. The research decided to further validate both of the two Chinese versions for Item 14.

Finally, a 66-item scale was constructed, which mainly included the 38 items on the revised translated-adapted Chinese PPE Scale (see Table 12), the 27 new items suggested by the Taiwanese content validators (see Table 16) and the adapted Item 1, ″Head nurse supports staff nurses in the unit″. Along with the 66-item scale, the cover letter, the consent forms and the demographic sheets were packed as a survey packaged for 5 Taiwanese nurses to evaluate the face validity. The Chinese translation for original Item 14, ″Not being placed in a position of having to do things against my professional judgment″ was separately printed on the last page of the survey to ask reviewers' opinions about it.

Results of Face Validity and Pilot Testing

In order to evaluate the face validity of the survey package and construct a pilot test for this study, five Taiwanese nurses recruited from outside the study hospitals were asked to pretend that they were in the survey of this study and validate the survey package. First, they were asked to read the cover letter and consent forms, fill out the scale and the demographic sheets; and record the time spent for completing the survey. After the 5 nurses completed the survey, they were then asked to judge and rate the understandability, clarity, and readability for the cover letter, consent from, and each of the items. In the end, these 5 nurses were asked to report how they perceived the similarity between the two Chinese translations for Item 14 and which one they would suggest the researcher to recruit into the scale. By summing the percentage of agreement for all of items receiving a rating of '3' or '4' from the 5 nurses, the results indicated that

all the indices of understandability, clarity, and readability for the cover letter, the consent form and for each of the 66 items on the scale were 1. Nothing was identified as problematic issue except the line space on the consent form. One of the nurses suggested to increasing the line space of the consent form to make the reader more comfortable. With regard to the dilemma of selecting the translation contents of 14, all the nurses thought the meanings between the two translations were same. Four of the five nurses preferred to use the revised Chinese translation for the Item 14, because the way of asking question for the respondent on the revised Item 14 was clearer. All the process for collecting survey data ran smoothly without any difficulty. The average time for a nurse to complete the survey was around 16 minutes. All the nurses expressed that it's not difficult in filling out the survey. The results of face validity supported the use of the 66-item scale as the prototype for psychometric evaluation in this study Meanwhile, the results of pilot testing also supported the appropriateness of moving to Phase II of this study.

Summary

Through the quality translation and adaptation process, the 38-item translated-adapted Chinese version of the PPE Scale demonstrated satisfactory semantic equivalency and content validity in terms of content equivalence as relative to the English PPE Scale. After content validation processes were performed, 27 new items were added to better understand the practice environment of nurses in Taiwan. To echo the revision of the original English PPE Scale and make the Chinese PPE Scale update, the 38-items

translated-adapted Chinese version of the PPE Scale were revised based on the revised PPE Scale. In the end, a 66-item scale composed of the 38 items on the revised translated-adapted Chinese PPE Scale, the 27 new items suggested by the Taiwanese content validators and the adapted Item 1 was developed for further psychometric evaluation. There were satisfactory results for face validity of the 66-item scale and for pilot testing.

CHAPTER V

RESULTS OF PSYCHOMERIC EVALUATION

Introduction

Through rigorous translation and adaptation processes in Phase I of this study, a 66-item adapted Chinese version of the PPE Scale (ACPPE) was produced. This chapter presents the psychometric evaluation of the ACPPE and the content analyses of participants' comments from phase II.

Results of Pilot Study

Ten Taiwanese nurses from outside the study hospitals were recruited for pilot testing the procedures for constructing the psychometric evaluation. The study package including the cover letter, consent forms, 66-item ACPPE and the demographic sheets were distributed to the participants. There was not reported difficulty encountered during the process of collecting survey data. The average time for a nurse to complete the survey was approximately 15 minutes. Eight of the 10 nurses reported that it's ″easy″ to fill out the survey. The results of pilot study supported the readiness for constructing psychometric evaluation.

Sampling

This study recruited staff nurses from 4 selected study hospitals located in the northern area of Taiwan. The sites included one teaching hospital and three regional teaching hospitals. One thousand two hundred and forty-three nurses were sampled in this study for psychometric evaluation of the ACPPE. Within the 1243 nurses, those

working on five selected units of the Hospital A were selected as the sub-sample for constructing the test-retest reliability.

Of the 1243 distributed surveys, 993 surveys were returned (79.89%). However, 16 surveys were discarded because seven surveys were completed by staff nurses working in the study hospitals less than three months; seven surveys were completed by Head nurses; one survey was totally blank; and one survey was not completed in the PPE scale part. Finally, the survey data from the 977 valid samples were used for psychometric evaluation (See Table 19).

Of the 104 staff nurses sampled for constructing the test-retest reliability, 81 nurses (77.88%) returned both of the pretest and post-test surveys. Two surveys were completed by Head nurses and were discarded. Seventy-nine valid cases were used for constructing test-retest reliability.

Table 19

Sampling and Responses Rate

Settings		Responses of Survey Samples					
Hospital [a]	Capacity (beds)	Distribute (*N*=1243)	Return (*N*=993)	Response rate (Total=79.89%)	Discard (*N*=16)	Valid (*N*=977)	
		n	n	%	n	n	%
A [a]	921	641	536	83.62	10	526	53.8
B [b]	600	262	212	80.92	2	210	21.5
C [b]	688	277	190	68.59	3	187	19.1
D [b]	400	63	55	87.30	1	54	5.5

Note. [a] : medical center; [b] = regional teaching hospital

Demographic Characteristics of the Sample

Within the 977 valid samples analyzed, participants' age ranged from 18 to 47 years (mean age=27.69 years) and had a mean of 71.82 months working as a registered nurses. Participants reported a mean of 50.26 months working on the unit with mean of 54.61 months working in the hospital (see Table 20).

Table 20

Continuous Demographic Characteristics of the Sample (*N*= 977)

Variables	Range	Mean	*SD*
Age	18-47	27.69	4.40
Months of being a nurse	3-320	71.82	54.23
Months of working on the unit	3-189	50.26	41.47
Months of working in the hospital	3-320	54.61	44.67

The majority of the participants were female (99.3%), single (70.8%), had a diploma as their highest educational degree (58.8%), worked full time (99.6%), worked as nurses (98.50%), were not studying for a degree (93.6%), were ranked as N1 (50.2), and worked on wards (43.0%). The majority of the participants (61.3%) reported that their salary was one of the major sources of family income. They reported a monthly salary between $3,0001 to $4,0000 NT dollars (57.2%) (see Table 21).

Table 21

Categorical Demographic Characteristics of the Sample (*N*= 977)

Variables	n	%
Gender	971	
Female	964	99.3
Male	7	0.7
Marital status	973	
Single	689	70.8
Married	272	28.0
Separated /Divorced	12	1.2
Highest educational degree	971	
Diploma	571	58.8
Bachelor	392	40.4
Master's degree	8	0.8
Current Work Status	972	
Full-time	968	99.6
Part-time	4	0.4
Work Position	972	
Nurses	957	98.5%
NSP	15	1.5
Studying for a degree	947	
No	886	93.6
Yes	61	6.4

Table 21 (continued)

Variables	n	%
Rank	960	
N0	25	2.6
N1	482	50.2
N2	271	28.2
N3	165	17.2
N4	17	1.8
Work Unit	977	
Ward	420	43.0
ICU	245	25.1
ER	80	8.2
OR	78	8.0
Hemodialysis Room	78	8.0
DR/BR/NBC	68	6.9
RCC	8	0.8
Salary as a major source of family income	959	
Yes	588	61.3
No	371	38.7
Monthly salary	969	
Less than 30000 NT dollars	80	8.2
30001~40000 NT dollars	554	57.2
40001~50000 NT dollars	320	33.1
Greater than 50000 NT dollars	15	1.5

Data Management

To prepare data for analysis, all study variables were examined for coding errors, systemic missing data, outliers, and marked skewness by computing descriptive statistics. All variables were checked for coding errors by comparing their minimum and maximum value with the value for label. Three variables were recoded because they had the minimum or maximum value falling out in the range of the value for label. Frequencies were computed in all variables to detect for missing data. A 5% critical value was used to detect the pattern of missing data (Munro, 2006). No variable of the 977 valid cases had more than 5% missing data. This indicated the pattern of missing data was random rather than systematically missing. All continuous variables were checked for outliers. Variables with a value greater or lower than 3 standard deviations away from mean were considered to have an outlier (Munro, 2006). Within the demographic data, all continuous variables had outliers, which included age, months of being a nurse, months of working on the unit, and months of working in the hospital. For the 66 items on the ACPPE, 38 of 66 variables had outliers. Variables with outliers were carefully checked. Because the variables with outliers had no coding error and the outliers were caused by biological diversity, diverse experience, and perceptional diversity among the different participants, no attempt was made to manage the outliers. All continuous variables were examined for marked skewness by using Fisher's measure of skewness, calculated by dividing the measure of skewness by the standard error of the skew. The absolute Z value for skewness divided by the standard error of skewness greater than 1.96 was considered significantly skewed

beyond the 0.05 (Munro, 2006). For demographic data, all continuous variables were significantly skewed (p <.05). Log transformation and square root transformation were performed to correct these skewed variables but failed. These skewed variables were created as categorical variables for further statistic analysis with the requirement for normal distribution (Munro, 2006).

For the 66 items on the ACPPE, all items were significantly skewed (p <.05) except nine items (Items 6, 8, 10, 18, 20, 21, 27, 31, and 56). Norris and Aroian (2004) noted that data transformation is not always necessary for computing Cronbach alpha or Pearson product-moment correlation for instrument with skewed item responses. No transformation was done for variables with significant skewness for further psychometric analysis in this study.

Among the four items used to test concurrent validity, two items were significantly skewed (p < .05), ″satisfaction for current nursing job″, and ″satisfaction for working on the unit″. Two items were not significantly skewed (P > .05), ″considering working in other hospital″, and ″considering not working as a nurse any more″. Performing log transformation and power transformation failed to correct these negatively skewed variables. No transformation was done for variables with significant skewness because correlation coefficients were computed for testing concurrent validly (Norris & Aroian, 2004).

Answers for Research Question 1: Evaluation of Conceptual Equivalence

The first research question of this study was ″to what extent can the equivalence

of the translated-adapted Chinese version of the PPE scale as relative to the English version of the PPE scale be demonstrated through the use of translation and adaptation techniques? ″ To answer this research question, the tested research hypothesis required was that the translated Chinese version of the PPE Scale could demonstrate semantic, content, and conceptual equivalence as relative to the English version of the PPE Scale. In Phase II, the conceptual equivalence of the translated-adapted Chinese version of the PPE Scale, as relative to the English version of the PPE Scale, was evaluated to test a part of the hypothesis for research question 1.

Psychometric Evaluation of the 38-Item ACPPE

To test the hypothesis, 38 items (Item 1 to Item 38) of the translated-adapted Chinese items were first selected to be examined for their psychometric properties to determine its conceptual equivalence as relative to the 38 items on the English version of the PPE Scale.

Initial Item Analysis and Reliability Estimates

On a 4-point scale, where 1= *strongly disagree* to 4= *strongly agree,* the mean for the 38 items of the translated-adapted Chinese version of the PPE Scale ranged from 2.31 (Item 8: *This unit has enough staff nurses to provide quality patient care.*) to 3.13 (Item 31: *I feel a high degree of personal responsibility for the work I do.*). An examination of the inter-item correlation matrix indicated that inter-item correlations ranged from a low of .01 between Item 19, ″Other hospital units seem to have a low opinion of this unit. ″, and Item 25, ″In this unit, the staff nurses involved do not settle disagreement until they

are all satisfied with the decision.″ to a high of .77 between Item 8, ″This unit has enough staff nurses to provide quality patient care. ″, and Item 10, ″This unit has enough staff nurses to get the patient care work done.″. All items significantly correlated ($r \geq .30$) with at lease two other items in the matrix (range: 2-21). Although some items had very weak correlations with one another (e.g., $r = .005$ between Item 19 and 25; $r = .006$ between Item 7 and 18; $r = .007$ between Item 27 and 31), none of the inter-item correlations were greater than .80. These inter-item correlations supported that the correlation Matrix had no reported problems with multicollinearity and that the wording and meaning of 38 items were not redundant (Pett, Lackey, & Sullivan, 2003).

Item-total correlations and Cronbach's alpha. The results showed Cronbach's alpha coefficient for the 38 items as a total scale was .91. The corrected item-total correlations for the 38 items on the ACPPE ranged from a low of .20 (Item 18: *This unit does not get the cooperation that it needs from other hospital units*.) to a high of .62 (Item 36: *Staff nurses in this unit can obtain the necessary resources to give appropriate care that is sensitive to patient's culture*.). All but three items (Item 14, 18, and 22) on the 38-item scale had corrected item-total correlation greater than .30 matching the minimum criterion for recruiting items in the scale (Nunnally, & Berstein, 1994). The original English version of the PPE scale was multi-dimensional, not uni-dimensional. The lower correlation coefficients of the three items might come from that the 38 items were treated as a single dimension scale rather than a multi-dimensional scale while computing corrected item-total correlations (DeVellis, 1991; Kline, 1999). Therefore, all items were

retained for preliminary factor analysis to reduce the risk of accidentally dropping potentially important items.

Principal Component Analysis for the 38-item ACPPE

The principal components factor analysis (PCA) with Varimax rotation and Kaiser normalization were performed to assess the dimensional structure of the 38-item ACPPE and to determine its conceptual equivalence with original English version of the PPE Scale. Data selected by excluding cases listwise indicated that with 944 subjects included and the 38-item tool used, there was a very good ratio of 24 subjects per item, thus matching the rules of thumb that a minimum of 10 subjects per item was needed to conduct factor analysis (Nunnally, 1978; Pett et al., 2003)

Prior to performing principal component analysis, the suitability of using factor analysis for the data was first assessed by using Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and Bartlett's Test of Sphericity. The KMO value (.92) and the significant result of Bartlett's Test of Sphericity ($\chi^2 = 13841.80$, $p = .00$) indicated that the correlation matrix was not an identity matrix and supported the use of factor analysis for the data was an appropriate procedure (Pett et al., 2004).

The initial Principal component analysis without rotating components revealed the presence of eight components with eigenvalues greater than 1, accounted for 57.23% of the overall variance between items. An inspection of the Scree Plot also revealed a clear break after the eighth component.

The researcher initially hypothesized that the 38-item ACPPE would be

constructed under eight components based on that the psychometric properties of the original PPE Scale. To test the initial hypothesis, PCA with Varimax rotation was performed by forcing the number of factors into eight originally identified components. The rotated component matrix revealed eight components together accounted for 57.22% of the overall variance between items. All 38 items loaded greater than .30 on one of the eight components.

PCA with items assigned by the psychometric structure of original PPE Scale. To test whether or not the 38-item ACPPE could demonstrate a psychometric structure similar to the original PPE Scale, the researcher assigned items to each component and named the components by using the psychometric structures of the original PPE Scale. The Cronbach's alpha coefficients for each component and the total 38-item scale were computed.

As shown in Table 22, by assigning the 38 items to eight components based on the psychometric structures of the original PPE Scale, seven of the eight components had problematic items with factor loading less than .30. The loadings of some items on factors differed across cultures (e.g., Items 17, 14, 5, 21, 22, 27, 2, 3, and 36). There were nine items (Items 17, 14, 5, 21, 22, 27, 2, 3, and 36) with factor loading less than .30 on their assigned component. The Cronbach's alpha coefficient for total 38-item scale was .91. The Cronbach's alpha coefficients for the eight components ranged from .59 to .87. There were four components (Factors 1, 3, 6, and 8) with Cronbach's alpha coefficient greater than .70. Of the four components with acceptable internal consistency,

only one component was a composite of items with factor loading greater than 3 and without any multiple loading. This component was named as Internal Work Motivation. As compared with the subscales of the original English version of the PPE Scale, Internal Work Motivation was the only same component found across cultures.

Summary

Through performing PCA with Varimax rotation, forcing items into 8 factors, and assigning items to the 8 components based on the psychometric structures of the original PPE Scale, the findings showed that the 38-item ACPPE could not demonstrate a psychometric structure similar to the original PPE Scale. The tested research hypothesis for Research question 1 of this study that the translated Chinese version of the PPE Scale demonstrates conceptual equivalence as relative to the English version of the PPE Scale was not supported.

Table 22

PCA Factor Loadings for the 38-Item ACPPE after Items Assigned by Original PPE Scale Psychometric Structure (N=944)

	Component							
	1	2	3	4	5	6	7	8
Factor 1: Internal work motivation								
Eigenvalue = 9.63								
% of variance explained= 11.42								
Cronbach's Alpha = .87								
# of items= 7								
32.I have challenging work to motivate me to do the best job.	**.80**							
34.I am motivated to do the best job because I am empowered by my work environment.	**.76**							
33.Working in this unit gives me opportunity to gain new knowledge and skills.	**.74**							
35.Working in this environment increases my feeling of professional growth.	**.74**							
31.I feel a high degree of personal responsibility for the work I do.	**.71**							
30.I feel a great sense of personal satisfaction when I do the job well.	**.69**							
29.My self-appraisal goes up when I work in this unit.	**.53**							

Table 22 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 2: Team work								
Eigenvalue = 3.03								
% of variance explained = 8.50								
Cronbach's Alpha = .64								
# of items= 4								
19.Other hospital units seem to have a low opinion of this unit.		**.71**						
20.Inadequate working relationship with other hospital groups limits the effectiveness of work in this unit.		**.71**						
18.This unit does not get the cooperation that it needs from other hospital units.		**.63**						
17.This unit has good working relationships with other groups in this hospital.		**.12**				.56		

Table 22 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 3: Control over practice								
Eigenvalue = 2.36								
% of variance explained = 5.31								
Cronbach's Alpha = .75								
# of items= 7								
8. This unit has enough staff nurses to provide quality patient care.			**.81**					
10.This unit has enough staff nurses to get the patient care work done.			**.77**					
7. I have sufficient time and opportunity to discuss patient care problems with other staff.			**.63**		.30			
6. This hospital has enough support services such as social services department, transferring center, medical affairs division, etc. to allow me to spend time with patients.			**.61**		.33			
11.Staff nurses have the opportunity to work in highly specialized patient care unit.			**.42**			.33		
14. In this unit, I am asked to do things against my professional judgment.		.55	**-.19**					
5. In this unit, patient care assignments facilitate the continuity of patient care.			**.26**		.57			

Table 22 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 4: Handling disagreement and conflict								
Eigenvalue = 1.64								
% of variance explained = 6.70								
Cronbach's Alpha = .67								
# of items= 8								
25. In this unit, the staff nurses involved do not settle disagreement until they are all satisfied with the decision.				**.68**				
28. The staff nurses involved settle the disagreement by consensus.				**.66**				
26. The experience and professional knowledge of staff nurses in this unit contribute to achieve the high quality solution.				**.62**				
23. In this unit, all points of views are considered in finding best solution to problems.			.32	**.49**				
24.All staff nurses in this unit work hard to reach the best possible solution.				**.46**			.34	.32
21.When staff nurses in this unit disagree, they ignore the problem and pretend that the problem will go away.		.71		**.15**				
22.Staff nurses in this unit withdraw from conflict.		.59		**.06**				
27. In this unit, disagreements between staff nurses are ignored or avoided.		.67		**.08**				

Table 22 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 5: Staff relationships with physicians **Eigenvalue = 1.38** **% of variance explained = 6.52** **Cronbach's Alpha = .59** **# of item = 2**								
4. There is a lot of teamwork between staff nurses and doctors.					**.60**			
13. There are good working relationships between doctors and nurses in this unit					**.32**	.41	.42	
Factor 6: Communication about patients **Eigenvalue = 1.24** **% of variance explained = 6.38** **Cronbach's Alpha = .73** **# of item = 2**								
15.I get information about patient's status when I need it.						**.75**		
16.When patient's status changes, I get relevant information quickly.						**.74**		

Table 22 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 7: Leadership and autonomy								
Eigenvalue = 1.13								
% of variance explained = 5.53								
Cronbach's Alpha = .68								
# of item = 2								
9. Head nurse in this unit is a good manager and leader.							**.78**	
12. Head nurse in this unit backs up staff nurses' decisions even they are in conflict with doctors							**.75**	
1. Leadership supports nursing					.54		**.30**	
2. In this unit, nursing controls its own professional practice.					.66		**.01**	
3. I have freedom to make important patient care and work decisions.					.55	.36	**.00**	
Factor 8: Cultural sensitivity								
Eigenvalue = 1.04								
% of variance explained = 4.23								
Cronbach's Alpha = .72								
# of item = 3								
38. Staff nurses respect their unit's diverse health care teams.								**.69**
37. Staff nurses in this unit are sensitive to the diverse patient populations whom they serve.								**.66**
36. Staff nurses in this unit can obtain the necessary resources to give appropriate care that is sensitive to patient's culture.	.47		.31					**.29**

Answers for Research Question 2

The second research question of this study was ″ To what extent can the psychometric properties of the translated-adapted Chinese version of the PPE Scale be demonstrated in a Sample of Taiwanese nurses working in acute care settings ? ″. The research hypothesis required to answer this question was that that the translated-adapted Chinese version of the PPE Scale could demonstrate acceptable psychometric properties in a sample of Taiwanese nurses working in acute care settings. Because some new items were added in to the translated-adapted Chinese version of the PPE Scale, several runs of psychometric evaluations were carefully performed using Principal component analysis to test the research hypothesis. First, only the 38 items (Item 1 to Item 38) on the ACPPE, which were the items developed on the original PPE Scale, were selected for principal component analysis. Second, principal component analysis with the 66 items (Item 1 to Item 66) on the ACPPE was performed. Finally according to these two psychometric results, another principal component analysis with the 58 items on the ACPPE was performed. The results of the three principal component analyses are presented bellow.

PCA for the 38 Items on the ACPPE without Assigning Items by the Psychometric Structure of Original PPE Scale

As mentioned earlier, using the 38 items (Item 1 to Item 38) on the ACPPE for PCA with Varimax rotation and forcing items into eight factors based on the original psychometric structure of the PPE Scale did not produce An acceptable solution (see Table 22). To pursue a parsimonious and interpretable solution with sound psychometric

properties for the 38 items of the ACPPE, the researcher and one of the tool developers (Dr. Dorothy Jones) of the original PPE Scale and revised PPE Scale, re-examined each item and assigned items to each component according to six critical criteria which included: (a) item-factor loading of at least .30, (b) item to total scale coefficient of at least .30 within the assigned component, (c) internal consistency of each component, (d) interpretability of the component. (e) item's meaning relative to the other items, and (f) item's potential cultural meaning to Taiwanese nurses (Nunnally, & Berstein, 1994; Pett et al., 2003; Hambleton, 2001; Kristjansson et al., 2003).

In the preliminary assignment, all but two items (Item 36, 13) matched the all of the above six criteria. Item 36 (Staff nurses in this unit can obtain the necessary resources to give appropriate care that is sensitive to patient's culture.) had significant multiple loadings (> .30) on Component 1 and 3. The meaning of Item 36 was not conceptually congruent with other items emerging on Component 1 or Component 3, which were related to the concepts of internal work motivation and control over practice, respectively. Item 13 (There are good working relationships between doctors and nurses in this unit.) loaded significantly (> .30) on Component 5, 6 and 7. Items emerging on Component 5, 6 and 7 were related to the concepts of autonomy, communication about patient care information, and supportive leadership respectively. The meaning of Item 13 was not conceptually congruent with other items emerging on Component 5, 6 or 7. Because the meanings of these two items were not conceptually consistent with other items on the loaded components, the two items (Item 36, 13) were eliminated from the further

psychometric analysis.

PCA for the 36-Item ACPPE

After the two items were eliminated, the remaining 36 items of the ACPPE were next subjected to PCA followed by Varimax rotation and Kaiser normalization. The KMO value was .91 and the Bartlett's Test of Sphericity was significant ($\chi^2 = 12727.59$, $p =. 00$). These results supported the appropriateness of performing factor analysis for the data. The initial principal component analysis with unrotated components revealed an eight-component solution with eigenvalues greater than 1, together accounting for 57.87% of the overall variance between items. An inspection of the Scree Plot also indicated a clear break after the eighth components. Therefore, the 36 items were analyzed by using PCA with Varimax rotation with forcing the number of factors into eight components. The communalities for the 36 items ranged from .44 to .77. Examination of the rotated component matrix indicated an eight-component solution with eigenvalue greater than 1, together accounting for 57.87% of the overall variance between items. All 36 items loaded greater than .30 on one of the eight components. The parsimonious and interpretable solution with eight components was obtained after assigning items based on the above six critical criteria.

Components of the 36-item ACPPE. The eight components of the 36-item scale were named and defined. Component I, with an eigenvalue of 8.87, consisted of seven items and accounted for 11.41% of variance. Component 2, with an eigenvalue of 3.02, consisted of seven items and explained 8.95% of variance. Component 3, with an

eigenvalue of 2.60, consisted of five items and explained 8.45% of variance. Component 4 through 8 with eigenvalues of 1.64, 1.38, 1.22, 1.08, and 1.04, accounted for 7.51%, 6.75%, 5.69%, 5.10%, and 4.01% of variance, respectively. Component 1 containing the same eight items of Internal Work Motivation subscale of the PPE Scale was also labeled as Internal Work Motivation. The original definition of Internal Work Motivation subscale in the PPE Scale was used to define Component 1, which referred to the self-generated encourage completely independent of external factors such as pay, supervision and co-workers. Component 2, with seven items, comprised three items (Item 18 through 20) from the original Teamwork domain, three items (Item 21, 22, and 27) form the original Handling Disagreement/Conflict domain, and one item (Item 14) from the original Control Over Practice domain. Component 2 was called Interpersonal Interaction and re-defined as the situation that staffs on the unit work with each other and with other units to solve problems with different opinions or judgments. Component 3, containing the same five items of Control over Practice subscale in the PPE Scale, was also named Control over Practice. Component 3 was defined as the same as the Control over Practice subscale in the PPE Scale, indicating sufficient intra-organizational status to influence others and to deploy resources when necessary for good patient care. Component 4 included five items (Item 23, 24, 25, 26, and 28) from the original Handling Disagreement/Conflict subscale of the PPE Scale. Component 4 was labeled Handling conflict and defined as the same as the original Handling Disagreement/Conflict subscale in the PPE Scale, referring to the degree to which

managing argument is addressed with a problem-solving approach. Component 5 consisted of three items (Item 1, 2, and 3) from original Leadership and Autonomy subscale, one item (Item 4) from original Staff Relationships with Physicians subscale, and one item (Item 5) from original Control over Practice subscale. Component 5 labeled Autonomy referred to the quality or state of being self-governing and exercising professional judgment in a timely fashion. Component 6 included two items from original Communication factor (Item 15 and 16) focusing on the communication about patient care information and one item from the original Teamwork factor (Item 17). Component 6 was labeled Communication about Patient Care Information. The original definition of Communication subscale in the PPE Scale was used to define Component 6, which referred to the degree to which patient care information was related promptly to the people who need to be informed through open channels of communication. Component 7 included two items (Item 9, 12) from original Leadership and Autonomy and was renamed as Supportive Leadership and re-defined as nurses' perceptions about the manager's ability and management style to create an environment that facilitate nursing care. Component 8 including two items from the original Cultural Sensitivity factor (Item 37, 38) was labeled Cultural Sensitivity. The original definition of Cultural Sensitivity subscale of the PPE Scale was used to define Component 8, which referred to a set of attitudes, practices, and /or policies that respects and accepts cultural difference (see Table 23). The descriptions of concepts underpinning the 36-item ACPPE are summarized in Table 24.

Table 23

PCA Factor Loadings for the 36-Item ACPPE (N=944)

	Component							
	1	2	3	4	5	6	7	8
Factor 1: Internal work motivation								
Eigenvalue = 8.87								
% of variance explained= 11.41								
Cronbach's Alpha = .87								
# of items= 7								
32.I have challenging work to motivate me to do the best job.	.80							
34.I am motivated to do the best job because I am empowered by my work environment.	.77							
33.Working in this unit gives me opportunity to gain new knowledge and skills.	.74							
35.Working in this environment increases my feeling of professional growth.	.74							
31.I feel a high degree of personal responsibility for the work I do.	.71							
30.I feel a great sense of personal satisfaction when I do the job well.	.69							
29.My self-appraisal goes up when I work in this unit.	.53			.41				

Table 23 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 2: Interpersonal interaction								
Eigenvalue = 3.02								
% of variance explained = 8.95								
Cronbach's Alpha = .79								
# of items= 7								
20.Inadequate working relationship with other hospital groups limits the effectiveness of work in this unit.		.72						
19.Other hospital units seem to have a low opinion of this unit.		.71						
21.When staff nurses in this unit disagree, they ignore the problem and pretend that the problem will go away.		.71						
27. In this unit, disagreements between staff nurses are ignored or avoided.		.66						
18.This unit does not get the cooperation that it needs from other hospital units.		.64						
22.Staff nurses in this unit withdraw from conflict.		.58						
14. In this unit, I am asked to do things against my professional judgment.		.56						

Table 23 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 3: Control over practice								
Eigenvalue = 2.60								
% of variance explained = 8.45								
Cronbach's Alpha = .81								
# of items= 5								
8. This unit has enough staff nurses to provide quality patient care.			.82					
10.This unit has enough staff nurses to get the patient care work done.			.79					
7. I have sufficient time and opportunity to discuss patient care problems with other staff.			.63		.30			
6. This hospital has enough support services such as social services department, transferring center, medical affairs division, etc. to allow me to spend time with patients.			.61		.34			
11. Staff nurses have the opportunity to work in highly specialized patient care unit.			.46					

Table 23 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 4: Handling conflict								
Eigenvalue = 1.64								
% of variance explained = 7.51								
Cronbach's Alpha = .73								
# of items= 5								
25. In this unit, the staff nurses involved do not settle disagreement until they are all satisfied with the decision.				.66				
26. The experience and professional knowledge of staff nurses in this unit contribute to achieve the high quality solution.				.65				
28. The staff nurses involved settle the disagreement by consensus.				.65				
23. In this unit, all points of views are considered in finding best solution to problems.			.34	.54				
24. All staff nurses in this unit work hard to reach the best possible solution.				.53				

Table 23 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 5: Autonomy								
Eigenvalue = 1.38								
% of variance explained = 6.75								
Cronbach's Alpha = .72								
# of item = 5								
2. In this unit, nursing controls its own professional practice.					.69			
4. There is a lot of teamwork between staff nurses and doctors.					.58			
5. In this unit, patient care assignments facilitate the continuity of patient care.					.57			
3. I have freedom to make important patient care and work decisions.					.57	.32		
1. Leadership supports nursing					.56		.37	
Factor 6: Communication about patient care information								
Eigenvalue = 1.22								
% of variance explained = 5.69								
Cronbach's Alpha = .71								
# of item = 3								
15.I get information about patient's status when I need it.						.78		
16.When patient's status changes, I get relevant information quickly.						.78		
17.This unit has good working relationships with other groups in this hospital.			.32			.52		

Table 23 (continued)

	Component							
	1	2	3	4	5	6	7	8
Factor 7: Supportive Leadership								
Eigenvalue = 1.08								
% of variance explained = 5.10								
Cronbach's Alpha = .77								
# of item = 2								
9. Head nurse in this unit is a good manager and leader.							.79	
12. Head nurse in this unit backs up staff nurses' decisions even they are in conflict with doctors							.75	
Factor 8: Cultural sensitivity								
Eigenvalue = 1.04								
% of variance explained = 4.01								
Cronbach's Alpha = .68								
# of item = 2								
38. Staff nurses respect their unit's diverse health care teams.								.69
37. Staff nurses in this unit are sensitive to the diverse patient populations whom they serve.								.65

Table 24

Descriptions of Concepts Underpinning the 36-Item ACPPE

Concept	Definition	n	α	M^a	M^b
1. Internal work motivation	Self-generated encouragement and commitment to work completely independent of external factors such as pay, supervision and co-workers (Hackman & Oldham, 1976, 1980; Ives Erickson, 2000).	7	.87	.49	.65
2. Interpersonal interaction	Ability of the staffs on a unit to work with each other and with other units to solve problems when there are different opinions or judgments.	7	.79	.35	.52
3. Control over practice	Sufficient intra-organizational status to influence others and to deploy resources when necessary for good patient care (Aiken, Havens, & Sloane, 2000; Ives Erickson, Hamilton, Jones, & Ditomassi, 2002).	5	.81	.45	.60
4. Handling conflict	The degree to which managing argument is addressed with a problem-solving approach (Zimmerman et al., 1993).	5	.73	35	.49

Note. M^a = average of inter-item correlations; M^b = average of item-to- total scale correlations.

Table 24 (continued)

Concept	Definition	n	α	M^a	M^b
5. Autonomy	The quality or state of being self-governing and exercising professional judgment in a timely fashion (Aiken et al., 1997).	5	.72	.35	.49
6. Communication about patient care information	The degree to which patient care information is related promptly to the people who need to be informed through open channels of communication Shortell, Rousseau, Gillies, Devers, & Simons, 1991).	3	.71	.46	.53
7. Supportive leadership	Nurses' perceptions about the manager's ability and management style to create an environment that facilitates nursing care.	2	.77	.63	.63
8. Cultural sensitivity	A set of attitudes, practices, and /or policies that respects and accepts cultural difference (Ives Erickson, 2000).	2	.68	.53	.53

Note. M^a = average of inter-item correlations; M^b = average of item-to- total scale correlations.

Item analysis and reliability estimation for the 36-itemACPPE. The Cronbach's Alpha, corrected item-to-total scale correlations, and inter-item correlations for the 36-item ACPPE were examined.

The 36-item scale had an overall alpha coefficient of .90. The Cronbach's alpha coefficient for Component 1 through 8 was .87, .79, .81, .73, .72, .71, .77, and .68, respectively (see Table 24).

The examination of each component's inter-item-correlations matrix indicated that the majority of inter-item correlations within each component were greater than .30 and less than .80. Four components had items with moderate inter-item- correlations (.20 < *r* <.30), including Internal Work Motivation (range: .28 to .68), Interpersonal Interaction (range: .22 to .53), Handling Conflict (range: .25 to .48), and Autonomy (range: .24 to .41). The inter-item correlation between Item 29 and Item 31within Internal Work Motivation factor was .28. Within Interpersonal Interaction factor, the inter-item correlation was .22 between Item 18 and Item 22; .25 between Item 14 and Item 22; .26 between Item 19 and Item 22; .27 between Item 14 and Item 27; and .29 between Item 20 and Item 22. Within Handling Conflict factor, the inter-item correlation was .25 between Item 24 and Item 28; .26 between Item 24 and Item 25; and .29 between Item 23and Item 28. The inter-item correlation between Item 1 and Item 4 within Autonomy factor was .24. In general, the average results for inter-item correlation indicated that each of the 36 items had an average inter-item correlation greater than .30. The average of inter-item correlations for Component 1 through 8 was .49, .35, .45, .35, 35, .46, .63, and .53,

respectively (see Table 24). These indicated that the items within each component were correlated but not redundant.

The average of item-to-total scale correlations for Component 1 through 8 was .65, .52, .60, .49, 49, .53, .63, and .53, respectively. All the corrected item-to-total scale correlations within each component were greater than .30 and less than .80. These results supported in that items within each component were significantly inter-correlated, but not redundant, and described meaningful aspects of the component (Nunnally, & Berstein, 1994).

Table 25 indicates that these means for the 8 subscales within the 36-item ACPPE ranged from 2.54 (Control over practice subscale) to 2.97 (Cultural sensitivity subscale). The correlations among the component-based scales ranged from a low of .11 between Interpersonal Interaction factor and Control over Practice factor to a high of .53 between Control over Practice factor and Autonomy factor. No inter correlation among the 8 factors was greater than .80, thus indicating that the extracted factors were not redundant.

Table 25

Correlations Coefficients of Eight Components of the 36-Item ACPPE (N=944)

Component	*M*	*SD*	F1	F2	F3	F4	F5	F6	F7	F8
F1. Internal work motivation	2.95	0.42	1.00							
F2. Interpersonal interaction	2.61	0.45	.22	1.00						
F3. Control over practice	2.54	0.54	.31	.11	1.00					
F4. Handling conflict	2.80	0.36	.42	.13	.48	1.00				
F5. Autonomy	2.94	0.39	.43	.26	.53	.46	1.00			
F6. Communication about patient care information	2.87	0.40	.37	.19	.50	.45	.46	1.00		
F7. Supportive leadership	2.85	0.61	.32	.21	.42	.44	.36	.34	1.00	
F8. Cultural sensitivity	2.97	0.41	.46	.18	.32	.46	.36	.35	.29	1.00

Test-retest reliability of the 36-item ACPPE. To construct the test-retest reliability of the scale, nurses working on five units of a surveyed hospital were asked to fill out the same survey twice at a 2-week interval. Using the data from the two surveys at a 2-week, Paired *t* tests, Wilcoxon Signed Rank test, Pearson correlation, and Intra-class Correlation Coefficients ($ICC_{1,1}$) were calculated to determine the test-retest reliability of the scale.

To test the difference between the scores of the total scale and the 8 subscales at the 2-week interval, a Paired *t* test was used for data with normal distribution and Wilcoxon Signed Rank test was used for data with significant skewness. Because 9 pairwise comparisons were computed, Bonferroni correction (.05/9) was used to prevent the chance of Type I error (Munro, 2006); thus a *p* value of .006 was considered significant.

The results showed that there was no significant difference between the scores of the total scale and 7of the 8 subscales at the 2-week interval ($p > .006$), except the Interpersonal Interaction subscale ($p = .002$). However, the scores of the 8 subscales and the total scale were significantly correlated at the 2-week interval ($p<.001$). The Pearson correlation coefficient for the 8 subscales ranged from .40 (Autonomy) to .62 (Control over practice) and was .72 for the total scale. The ICC (1,1) was .71 for the total scale and ranged from .39 (Autonomy) to .60 (Internal work motivation) for the 8 subscales. These findings indicated that the total scale of the 36-item ACPPE had good test-retest reliability (see Table 26).

Table 26

Test Retest Reliability of the Eight Subscales and Total Scale of the 36-Item ACPPE

Score	n	*M*	*SD*	*t*	*r*	ICC $_{(1,1)}$
Internal work motivation	78					
Time 1		3.01	0.36	0.78	.59**	.60
Time 2		2.98	0.38			
Interpersonal interaction	78					
Time 1		2.79	0.43	3.25*	.58**	.54
Time 2		2.64	0.46			
Control over practice	79					
Time 1		2.67	0.50	-2.25	.62**	.59
Time 2		2.77	0.43			
Handling conflict[a]	79					
Time 1		2.85	0.26	-0.29	.43**	.42
Time 2		2.86	0.31			
Autonomy	78					
Time 1		3.04	0.35	0.80	.40**	.39
Time 2		3.01	0.31			

Note. [a] Wilcoxon Signed Rank test was performed; * p< .006; ** p<.001

Table 26 (continued)

Score	n	*M*	*SD*	*t*	*r*	ICC $_{(1,1)}$
Supportive leadership[a]	79					
Time 1		2.93	0.50	1.90	.48**	.47
Time 2		2.82	0.49			
Cultural sensitivity[a]	79					
Time 1		2.99	0.36	1.41	.48**	.44
Time 2		2.93	0.32			
Communication about patient care information[a]	79					
Time 1		2.98	0.36	-0.73	.61**	.61
Time 2		3.00	0.34			
Total scale	76					
Time 1		2.90	0.25	-1.66	.72	.71
Time 2		2.87	0.27			

Note. [a] Wilcoxon Signed Rank test was performed; * p< .006; ** p<.001

Concurrent validity for the 36-item ACPPE. Four items on the demographic sheets were used to test the concurrent validity of the 36-item ACPPE. Using a 5-point Likert scale, these four items separately measured nurses' perceptions about satisfaction for current nursing job, satisfaction for working on the unit, considering

working on other hospital, and considering not working as a nurse any more.

A 5-point Likert scale, where 1= very *dissatisfied* to 5= very *satisfied,* was applied to measure nurses' perceptions about satisfaction for current nursing job and satisfaction for working on the unit. Another 5-point Likert scale, where 1= *never consider* to 5= *always consider,* was used to measure nurses' perceptions about considering working in another hospital, and considering not working as a nurse any more. On a 5-point scale, the mean of satisfaction for current nursing was 3.09 and the mean for satisfaction for working on the unit was 2.49. The mean response to the question of considering working in other hospital was 3.02. The mean response to the question of considering not working as a nurse any more was 3.30 (see Table 27).

Table 27

Nurse's satisfactions with Jon and Work Unit and Intent to Leave (*N*= 977)

Variables	Range	Mean	*SD*
Satisfaction for current nursing job	1-5	3.09	.67
Satisfaction for working on the unit	1-5	3.12	.68
Considering working in another hospital	1-5	3.02	.03
Considering not working as a nurse any more	1-5	3.30	.04

Pearson correlations coefficients between scores for eight subscales and the total scale on the 36-item ACPPE and scores of nurse's satisfaction and scores of nurse's intent to leave were calculated. As shown in Table 28, the scores of the eight subscales and the total scale were significantly and positively correlated with the scores of nurses'

perceptions about satisfaction for current nursing job and satisfaction for working on the unit ($p < .01$). The significant positive correlation coefficients indicated that the higher perceived professional practice environment was, the higher perceived satisfaction for current nursing job and for working on the unit was.

As shown in Table 29, all but one subscale, Cultural sensitivity, had scores of the subscales and the total scale that were significantly and negatively correlated with the scores of nurses' perceptions about considering working in another hospital or the scores of nurses' perceptions about considering not working as a nurse any more ($p < .01$). The significant negative correlation coefficient indicated that the lower perceived professional practice environment was, the higher perceived working in another hospital and not working as a nurse any more was.

These Pearson correlation coefficients results supported that the 36-item ACPPE has acceptable concurrent validity.

Summary

The results showed that the 36-item ACPPE could demonstrate a satisfactory psychometric structure through PCA with Varimax rotation and had acceptable, internal consistency, test-retest reliability and concurrent validity. The results supported to accepting the tested research hypothesis for Research question 2 that is the translated-adapted Chinese version of the PPE Scale demonstrated acceptable psychometric properties in a sample of Taiwanese nurses working in acute care settings.

Table 28

Pearson Correlations between Scores of the 36-Item ACPPE and Scores of Nurse's Satisfaction (N=915)

	Criterion items	
Scores	Satisfaction for current nursing job	Satisfaction for working on the unit
Internal work motivation	0.35**	0.34**
Interpersonal interaction	0.25**	0.27**
Control over practice	0.32**	0.35**
Handling conflict	0.22**	0.25**
Autonomy	0.30**	0.28**
Communication about patient care information	0.21**	0.24**
Supportive leadership	0.20**	0.24**
Cultural sensitivity	0.13**	0.17**
Total scale	0.42**	0.43**

Note. ** p<.01

Table 29

Pearson Correlations between Scores of the 36-Item ACPPE and Scores of Nurse's Intent to Leave (N=915)

	Criterion items	
Scores	Considering working on other hospital	Considering not working as a nurse any more
Internal work motivation	-0.20**	-0.21**
Interpersonal interaction	-0.21**	-0.19**
Control over practice	-0.30**	-0.14**
Conflict Management	-0.22**	-0.10**
Autonomy	-0.19**	-0.14**
Communication about patient care information	-0.22**	-0.10**
Supportive leadership	-0.24**	-0.10**
Cultural sensitivity	-0.11**	-0.03
Total scale	-0.33**	-0.23**

Note. ** p<.01

Psychometric Evaluation of the 66 Items on the ACPPE

The original English version of the PPE Scale consisted of 38 items. The 38 items were translated into Chinese and adapted to reflect the meaning of the terms within Chinese culture based on respondents opinions. After the 38-item ACPPE was validated by Taiwanese nursing experts, new items were added as suggested. As mentioned earlier, following completion of Phase I of this study, the 66-item ACPPE was produced for psychometric evaluation. Keller and Dansereau (2001) noted that adding items to measures requires empirical examination of the consequences of the changed as well as the attention to theoretical issues. Based on the concern about the possibility of changing the meaning of a construct by adding items, the researcher further evaluated the psychometric properties of the 66-item ACPPE, consisted of the original 38 items of the PPE Scale and the 28 new items added with the concern about cultural sensitivity.

To answer the second research question, ″To what extent can the psychometric properties of the translated-adapted Chinese version of the PPE Scale be demonstrated in a sample of Taiwanese nurses working in acute care settings?”, the second research hypothesis, ″The translated-adapted Chinese version of the PPE Scale demonstrates acceptable psychometric properties in a sample of Taiwanese nurses working in acute care settings.”, was tested by using the principal components factor analysis (PCA) with Varimax rotation and Kaiser normalization to assess the dimensional structure of the 66-item ACPPE. Data selected by excluding cases listwise indicated that with 928 subjects included and 66-item tool used, there was a ratio of 14 subjects per item.

Initial Item Analysis and Reliability Estimates

On a 4-point scale, where 1= *strongly disagree* to 4= *strongly agree,* the means for the 66 items of the translated-adapted Chinese version of the PPE Scale ranged from 2.31 (Item 8: *This unit has enough staff nurses to provide quality patient care.* ; Item 56*: This hospital provides multilingual health care brochures/sheets for nurses in clinical practice.*) to 3.13 (Item 31: *I feel a high degree of personal responsibility for the work I do.*).

Item-total correlations. An examination of the inter-item correlation matrix indicated that inter-item correlations ranged from a low of .001 between Item 19, ″Other hospital units seem to have a low opinion of this unit.″, and Item 25, ″In this unit, the staff nurses involved do not settle disagreement until they are all satisfied with the decision. ″ to a high of .79 between Item 52, ″ In this unit, there is a good work relationship among nurses. ″, and Item 53, ″ In this unit, nurses help one another to achieve work goals. ″. All items significantly correlated ($r \geq .30$) with at lease one other items in the matrix (range: 1-43). None of the inter-item correlations was greater than .80, thus indicating an absence of problems with multicollinearity and the wording and meaning of 38 item was not redundant (Pett, et al., 2003). There were some items that had very weak correlations with one another. However, the inter-item correlations supported that no item on the 66-item scale was redundant.

Cronbach's alpha. The Cronbach's alpha coefficient for the 66 items was .95. The corrected item-total correlations ranged from a low of .15 (Item 18: *This unit does not get*

the cooperation that it needs from other hospital units.) to a high of .64 (Item 36: *Staff nurses in this unit can obtain the necessary resources to give appropriate care that is sensitive to patient's culture.*). All but five items (Item 14, 18, 22, 27 and 56) on the 66-item scale had corrected item-total correlation greater than .30.

The original English version of the PPE scale was multi-dimensional, not uni-dimensional. The lower correlation coefficients of the three items might come from that the 66 items were treated as a single dimension scale rather than a multi-dimensional scale while computing corrected item-total correlations (DeVellis, 1991; Kline, 1999). Therefore, all items were retained for preliminary factor analysis to reduce the risk of accidentally dropping potentially important items.

PCA for the 66- Item ACPPE

Prior to performing principal component analysis, the suitability of using factor analysis for the data was first assessed by using Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and Bartlett's Test of Sphericity. The KMO value (.94) and the significant result of Bartlett's Test of Sphericity ($\chi^2 = 30079.03$, $p = .00$), indicated that the correlation matrix was not an identity matrix, thus supporting the use of factor analysis for the data.

The initial Principal component analysis without rotating components revealed the presence of thirteen components with eigenvalues greater than 1, Together these components accounted for 60.20% of the overall variance between items. However, an inspection of the Scree Plot suggested that 8, 9, 10, 11, and 12-factor solution should be

examined. Multiple runs of factor analysis using different extraction methods with Varimax or direct Oblimin by forcing the number of factors into 8 through 13 components were performed. The factor analysis results indicated the 12-factor solution, produced by using PCA with Varimax rotation and forcing the number of factors into 12, was the most interpretable.

The researcher and one of the tool developers (Dr. Dorothy Jones) of the original PPE Scale and the revised PPE Scale, re-examined the rotated component matrix and assigned items to each component according to six critical criteria which included: (a) item-factor loading of at least .30, (b) item to total scale coefficient of at least .30 within the assigned component, (c) internal consistency of each component, (d) interpretability of the component. (e) item's meaning relative to the other items, and (f) item's potential cultural meaning to Taiwanese nurses (Nunnally, & Berstein, 1994; Pett et al., 2003; Hambleton, 2001; Kristjansson et al., 2003). In the preliminary assignment, all but two items (Item 36 and 54) matched the all of the above six criteria. Because these two items' meanings were not conceptually consistent with other items on the loaded components, these two items were eliminated from the further psychometric analysis.

PCA for the 64- Item ACPPE

After the two items were eliminated, the remaining 64 items which included 37 original PPE items and 27 new added items were next subjected to PCA followed by Varimax rotation and Kaiser normalization. The KMO value (.94) and the significant result of Bartlett's Test of Sphericity ($\chi^2 = 28800.69$, $p =. 00$) supported that the use of

factor analysis for the data was appropriate.

PCA with Varimax rotation along with forcing the number of factors into twelve components revealed a 12-component solution with eigenvalues greater than 1, together accounting for 58.98% of the overall variance between items. The communalities for the 64 items ranged from .42 to .76. All 64 items loaded greater than .30 on one of the twelve components. By assigning items based on the above six critical criteria, the parsimonious and interpretable solution with 12 component was obtained. The twelve components of the 64-item scale were named and defined. The twelve components underpinning the 64-item scale are presented in Appendix O. Component 1, with an eigenvalue of 17.11, consisted of seven items and accounted for 6.94% of variance. Component 2, with an eigenvalue of 3.54, consisted of five items and explained 6.90% of variance. Component 3, with an eigenvalue of 2.86, consisted of six items and explained 5.94% of variance. Component 4, with an eigenvalue of 2.33, consisted of five items and explained 5.61% of variance. Component 5, with an eigenvalue of 2.09, consisted of seven items and explained 5.27% of variance. Component 6 through 12 with eigenvalues of, 1.83, 1.71, 1.52, 1.27, 1.23, 1.15, and 1.11 accounted for 4.66%, 4.26%, 4.03%, 4.01%, 3.92%, and 3.23% of variance, respectively.

Components of the 64-item ACPPE. Component 1 containing the same seven items from the original Internal Work Motivation subscale in the PPE Scale was also labeled as Internal Work Motivation. The original definition of Internal Work Motivation subscale in the PPE Scale was used to define Component 1, which was the self-generated

encouragement and commitment to work completely independent of external factors such as pay, supervision and co-workers. Component 2, with 7 items, included one old item (Item 13) from the Staff Relationship with Physician domain in the original PPE Scale and four new items, added to describe the relationships between nurses and physicians. Therefore, Component 2 was renamed as Relationships between Staff Nurses and Physicians and redefined as the association between staff nurses and physicians that facilitates the communication and the collaboration of quality patient care between professional disciplines. Component 3, containing 6 new added items related to learning activities for nurses, was labeled Support for Nursing Professional Development and defined as the degree to which nurses are supported by the organization to participate learning activities that assist in developing and maintaining competence, enhance professional practice, and support the achievement of career goals. Component 4, containing the five items from the Control over Practice subscale in the original PPE Scale, was named Control over Practice. The original definition of Control over Practice subscale in the PPE Scale was used to define Component 4, which indicated sufficient intra-organizational status to influence others and to deploy resources when necessary for good patient care. Component 5, with seven items, comprised three items (Item 18 through 20) from the original teamwork domain, three original Handling Disagreement/Conflict items (Item 21, 22, and 27), and one item (Item 14) from the Control over Practice domain in the original PPE Scale. Component 5 was called Interpersonal Interaction, and described how the staffs on a unit to work with each other

and with other units to solve problems when there are different opinions or judgments. Component 6, with seven items, included four items (Item 23, 24, 25, 26, and 28) from Handling Disagreement/Conflict in the original PPE Scale and two new were added related to collaboration among nurses. Component 6 was labeled Conflict Management referring to that Staff nurses working together collaboratively to handle conflict in order to provide quality patient care. Component 7 included two items (Item 9, 12) from the original Leadership and Autonomy subscale in the PPE Scale and added one new item related to the management style of a head nurse. Component 7, with three items, was named Supportive Leadership, described as nurses' perceptions about the manager's ability and management style to create an environment that facilitates nursing care. Component 8, labeled Support for Professional Practice, included five new items related to the support from organization. Component 8 was defined as that an organization's ability to provide adequate resources for nurses to function effectively to provide quality patient care. Component 9 included six new items related to nursing activities to keep patient safe. Component 9 was named Patient Surveillance and defined as prevention of adverse events, risk identification, early response to changes in patients' condition and implementation of interventions to rescue and restore the patients to health. Component 10 named Nursing Care consisted of two items (Item 37, 38) from Cultural Sensitivity subscale in the original PPE Scale and added three new items. Component 10 was defined as the degree to which staff nurses deliver professional nursing to provide quality patient care. Component 11 consisted of five items from the original PPE Scale, including

three items (Item 1, 2, and 3) from the Leadership and Autonomy subscale, one item (Item 4) from the Staff Relationships With Physicians subscale, and one item (Item 5) from Control over Practice subscale. Component 11 was called Autonomy. The original definition of Leadership and Autonomy subscale in the PPE Scale was used to define Component 11, which indicated the quality or state of being self-governing and exercising professional judgment in a timely fashion. Component 12 included two items from original Communication factor (Item 15 and 16) focusing on the communication about patient care information and one item from the original Teamwork factor (Item 17). Component 12 was labeled Communication about Patient Care Information. The original definition of Communication subscale of the PPE Scale was used to define Component 12, which referred to the degree to which patient care information is related promptly to the people who need to be informed through open channels of communication. The descriptions of concepts underpinning the 64-item ACPPE are summarized in Table 30.

Table 30

Descriptions of Concepts Underpinning the 64-Item ACPPE

Concept	Definition	n	α	M^a	M^b
1. Internal work motivation	Self-generated encouragement and commitment to work completely independent of external factors such as pay, supervision and co-workers (Hackman & Oldham, 1976, 1980; Ives Erickson, 2000).	7	.87	.49	.65
2. Relationship between staff nurses and physicians	The association between staff nurses and physicians that facilitates the communication and the collaboration of quality patient care between professional disciplines.	5	.88	.59	.72
3. Support for nursing professional development	The degree to which nurses are supported by the organization to participate learning activities that assist in developing and maintaining competence, enhance professional practice, and support the achievement of career goals.	6	.85	.49	.63
4. Control over practice	Sufficient intra-organizational status to influence others and to deploy resources when necessary for good patient care (Aiken, Havens, & Sloane, 2000; Ives Erickson, Hamilton, Jones, & Ditomassi, 2002).	5	.81	.45	.60

Note. M^a = average of inter-item correlations; M^b = average of item-to- total scale correlations.

Table 30 (continued)

Concept	Definition	n	α	M^a	M^b
5. Interpersonal interaction	Ability of the staffs on a unit to work with each other and with other units to solve problems when there are different opinions or judgments.	7	.79	.35	.52
6. Conflict Management	Staff nurses working together collaboratively to handle conflict in order to provide quality patient care.	7	.79	.35	.52
7. Supportive leadership	Nurses' perceptions about the manager's ability and management style to create an environment that facilitates nursing care.	3	.83	.63	.70
8. Support for professional practice	An organization's ability to provide adequate resources for nurses to function effectively to provide quality patient care.	5	.73	.35	.49

Note. M^a = average of inter-item correlations; M^b = average of item-to- total scale correlations.

Table 30 (continued)

Concept	Definition	n	α	M^a	M^b
9. Patient surveillance	Prevention of adverse events, risk identification, early response to changes in patients' condition and implementation of interventions to rescue and restore the patients to health.	6	.80	.41	.56
10. Nursing care	The degree to which staff nurses deliver professional nursing to provide quality patient care	5	.77	.40	.54
11. Autonomy	The quality or state of being self-governing and exercising professional judgment in a timely fashion (Aiken et al., 1997).	5	.72	.35	.49
12. Communication about patient care information	The degree to which patient care information is related promptly to the people who need to be informed through open channels of communication Shortell, Rousseau, Gillies, Devers, & Simons, 1991).	3	.71	.46	.53

Note. M^a = average of inter-item correlations; M^b = average of item-to- total scale correlations..

Cronbach's Alpha of the 64-item ACPPE. As shown in Table 30, the 64-item scale had an overall alpha coefficient of .95. The Cronbach's alpha coefficient for Component 1 through 12 was .87, .88, .85, .81, .79, 79, .83, .73, .80, .77, .72, and .71, respectively.

Inter-item correlations of the 64-item ACPPE. The examination of each component's inter-item-correlations matrix indicated that the majority of inter-item correlations within each component were greater than .30 and less than .80. The inter-item correlations indicated some items within the components were moderately inter-correlated ($.20 < r < .30$). Six components had items with inter-item- correlations less than .30, including Internal Work Motivation (range: .28 to .68), Interpersonal Interaction (range: .22 to .53), Conflict Management (range: .16 to .79), Support for Professional Practice (range: .23 to .54), Patient Surveillance (range: .26 to .59), Autonomy (range: .24 to .41). The inter-item correlation between Item 29 and Item 31 was .28 within Internal Work Motivation factor. Within the Interpersonal Interaction factor, the inter-item correlation was .22 between Item 18 and Item 22; .25 between Item 14 and Item 22; .26 between Item 19 and Item 22; .27 between Item 14 and Item 27; and .29 between Item 20 and Item 22. Within Conflict Management factor, the inter-item correlation was .16 between Item.25 and Item 53; .20 between Item 25 and Item 52; .25 between Item 24 and Item 28;.26 between Item 23 and Item 53; .28 between Item 23 and Item 52; and .29 between Item 23 and Item 28. Within Support for Professional Practice factor, the inter-item correlation was .23 between Item 56 and Item 65; .26 between Item 56 and Item 64; .27 between Item 41 and Item 56; .29 between Item 55 and Item 65. The

inter-item correlation was .26 between Item 45 and Item 48 within Patient Surveillance factor and .24 between Item 1 and Item 4 within Autonomy factor. Although the above items within their component had an inter-item correlation less than .30, all the 64 items except Item 25 (r =.27) had an average inter-item correlation greater than .30. As shown in Table 30, the average of inter-item correlations for Component 1 through 12 was .49, .59, .49, .45, .35, .35, .63, .35, .41, .40, .35, and .46, respectively. These indicated that the items within each component were somehow correlated but not redundant.

Item-to-total scale correlations of the 64-item ACPPE. The average of corrected item-to-total scale correlations for Component 1 through 11 was .65, .72, .63, .60, .52, .52, .70, .49, .56, .54, ..49, and .53, respectively, (see Table 30). All item-to- total scale correlations within each component were greater than .30 and less than .80. These results supported in that items within each component were significantly inter-correlated, but not redundant, and describe meaningful aspects of the component (Nunnally, & Berstein, 1994).

Correlations among the 12 components of the 64-item ACPPE. As shown in Table 31 showed that the mean scores for the 12 subscales of the 64-item ACPPE. Mean scores distributed for testing ranged from 2.47 (Support for professional practice) to 2.96 (Internal work motivation). The correlations among the 12 components ranged from .11 between Interpersonal Interaction factor and Control over Practice factor to .61 between Patient Surveillance factor and Nursing Care factor. No inter-correlation among the 12

factors was greater than .80, indicating that the extracted factors were not redundant.

Summary

The psychometric evaluation of the 66 items on the ACPPE revealed that following the elimination of two items that were not conceptually consistent with other items on the loaded components, the remaining 64 items subjected to PCA with Varimax rotation could demonstrate acceptable psychometric properties in a sample of Taiwanese nurses working in acute care settings. The results supported accepting the tested research hypothesis for Research question 2 that is the 64-items ACPPE could demonstratesacceptable psychometric properties in a sample of Taiwanese nurses working in acute care settings.

Table 31

Correlations Coefficients of Twelve Components of the 64-Item ACPPE (N=928)

Component	*M*	*SD*	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
F1. Internal work motivation	2.96	.43	1.00											
F2. Relationship between nurses and physicians	2.73	.51	.43	1.00										
F3. Support for professional development	2.94	.42	.49	.48	1.00									
F4. control over practice	2.54	.55	.31	.52	.44	1.00								
F5. Interpersonal interaction	2.60	.46	.23	.23	.31	.11	1.00							
F6. Conflict management	2.86	.34	.46	.54	.54	.46	.17	1.00						
F7. Supportive leadership	2.87	.58	.36	.44	.50	.41	.24	.49	1.00					
F8. Support for professional practice	2.47	.51	.33	.50	.55	.51	.11	.48	.43	1.00				
F9. Patient surveillance	2.93	.35	.50	.59	.57	.40	.24	.59	.36	.40	1.00			
F10. Nursing care	2.95	.35	.59	.55	.56	.42	.24	.59	.41	.41	.61	1.00		
F11. Autonomy	2.94	.40	.43	.54	.48	.54	.27	.46	.38	.36	.45	.48	1.00	
F12. Communication about patient care information	2.87	.40	.37	.51	.44	.50	.19	.46	.35	.38	.47	.45	.47	1.00

Comparison of Psychometric Properties among the Original 38-Item PPE, 36-Item ACPPE, and 64-Item ACPPE

Comparison between the original PPE and the 36-ItemACPPE

Through testing the 38 original PPE items with a group of Taiwanese nurses, the PCA with Varimax rotation for the 38 original PPE items revealed that using 36 of the 38 items for analysis could produce a satisfactory psychometric solution underpinned by 8 components. The results showed that the psychometric properties of 38 original PPE items slightly changed across different cultures. As shown in Table 32, the factor-loading pattern of 36 items was not completely consistent with the original PPE Scale. Many items loaded in different components as relative to original PEE Scale (e.g., Items 4, 5, 9, 12, 14, 13, 17, 21, 22, and 27). There was only one component (Internal Work Motivation) which was underpinned by the same items across culture. There were some components that were found across cultures, but differed somewhat cross-culturally (e.g., Control over Practice, Autonomy, Handling Disagreement and Conflict, and Communication about Patient). The items of original Teamwork component emerged into other fcomponents, so the Teamwork component of the original PPE Scale disappeared in Taiwanese culture. The original component, Handling Disagreement and Conflict, split into two components, Interpersonal Interaction and Handling Conflict. The original component, Leadership and Autonomy in Clinical Practice, split into two components, Supportive Leadership and Autonomy.

Table 32

Comparison of Psychometric Structures between Original 38-Item English PPE and 36-Item ACPPE

Original 38-item English PPE (α = .93)				36-item ACPPE (α = .90)			
Concept	n	Items	α	Concept	n	Items	α
1. Internal work motivation	7	29 30 31 32 33 34 35	.86	1. Internal work motivation	7	29 30 31 32 33 34 35	.87
2. Control over practice	7	5 6 7 8 10 11 14	.82	2. Control over practice	5	6 7 8 10 11	.81
3. Teamwork	4	17 18 19 20	.78	3. Interpersonal interaction	7	14 18 19 20 21 22 27	.79
4. Handling disagreement and conflict	8	21 22 23 24 25 26 27 28	.88	4. Handling conflict	5	23 24 25 26 28	.73
5. Leadership and autonomy in clinical practice	5	1 2 3 9 12	.83	5. Autonomy	5	1 2 3 4 5	.72
6. Clinician-physician relationships	2	4 13	.79	6. Supportive leadership	2	9 12	.77
7. Communication about patients	2	15 16	.80	7. Communication about patient care information	3	15 16 17	.71
8. Cultural sensitivity	3	36 37 38	.78	8. Cultural sensitivity	2	38 37	.68

Comparison between the original PPE and the 64-Item ACPPE

As mentioned earlier, in translation and adaptation processes of this study, Item 1 ″Leadership supportive to department or unit staff.″ on the original PPE Scale was culturally translated and adapted to read ″Head nurse supports staff nurses in the unit″. However, the appropriateness of adaptation of Item 1 was questioned by one of the PPE Scale developers. In order to better help the researcher to objectively select the translated-adapted item for cross-cultural use, both of the two translated-adapted Chinese statements for Item 1 were retained for further validation, which included ″Head nurse supports staff nurses in the unit″ and ″Leadership supports nursing″. Meanwhile, after content validation process, 27 new items were suggested by the Taiwanese content validators to be added into the scale. Therefore, in the end, a 66-item scale was produced for psychometric evaluation, which included 38 original PPE items, 27 new items and the ambiguous adapted Item 1. The PCA with Varimax rotation for these 66 items showed that using 64 of the 66 items for analysis could produce another satisfactory psychometric solution underpinned by 12 components. The psychometric structure of the 64 items on the PCA-derived scale, which included 37 original PPE items, 26 new items and an ambiguous adapted item, was different from the original PPE Scale. The psychometric analysis showed that the factor-loading pattern of the original PPE items and the meaning of components of the original PPE Scale changed, after the new items were added. Within the 64-item PCA-derived scale, only 10 added items (Items 39, 40, 42, 43, 44, 46, 52, 53, 57, and 66) clustered with the some original PPE items. Seventeen added items (Item 39 to 65, except Item 54) did not cluster with any original PPE item but together produced

three new components that the original PPE did not include. There was only one component (Internal Work Motivation) of the original PPE Scale found to be underpinned by the same items across cultures (see Table 33).

Comparison between the 36-Item ACPPE and the 64-Item ACPPE

As shown in Table 34, the psychometric evaluation of the 38 original PPE items in a sample of Taiwanese nurses showed that PCA with Varimax rotation for 38 original PPE items produced a 36-item scale underpinned by eight factors with satisfactory psychometric properties. After 28 items were added into the 38 original PPE items for statistic analysis, PCA with Varimax rotation for the 66 items produced a 64-item scale underpinned by 12 factors with satisfactory psychometric properties. These two results showed that even within the same Taiwanese culture, adding items into PPE Scale did not change the factor-loading pattern of the original PPE items (Item 1 to 38), but could develop more concepts into the PPE Scale and changed the meaning of two components of the 36-item scale. For example, because of the 10 added items (Items 39, 40, 42, 43, 44, 46, 52, 53, 57, and 66) which clustered with original PPE items, the meaning of two components of the 36-item scale changed, which included Handling Conflict factor and Cultural Sensitivity factor. The Clinical-Physicians Relationships factor, one of the eight components underpinning the original PPE Scale, did not emerge in the 36-item Chinese PPE scale until four items were added and clustered with the original PPE.

Table 33

Comparison of Psychometric Structures between Original 38-Item English PPE and 64-Item ACPPE

Original 38-item English PPE (α = .93)				64-item ACPPE (α = .95)			
Concept	n	Items	α	Concept	n	Item	α
1. Internal work motivation	7	29 30 31 32 33 34 35	.86	1. Internal work motivation	7	29 30 31 32 33 34 35	.87
2. Control over practice	7	5 6 7 8 10 11 14	.82	2. Interpersonal interaction	7	14 18 19 20 21 22 27	.79
3. Teamwork	4	17 18 19 20	.78	3. Control over practice	5	6 7 8 10 11	.81
4. Handling disagreement and conflict	8	21 22 23 24 25 26 27 28	.88	4. Conflict Management	7	23 24 25 26 28 52 53	.79
5. Leadership and autonomy in clinical practice	5	1 2 3 9 12	.83	5. Autonomy	5	1 2 3 4 5	.72
6. Clinician-physician relationships	2	4 13	.79	6. Communication about patient care information	3	15 16 17	.71
7. Communication about patients	2	15 16	.80	7. Supportive leadership	3	9 12 66	.83
8. Cultural sensitivity	3	36 37 38	.78	8. Nursing care	5	37 38 39 40 57	.73
				9. Relationship between staff nurses and physicians	5	13 42 43 44 46	.88
				10. Support for nursing professional development	6	58 59 60 61 62 63	.85
				11. Patient surveillance	6	45 47 48 49 50 51	.80
				12. Support for professional practice	5	41 55 56 64 65	.73

Table 34

Comparison of Psychometric Structures between 36-Item ACPPE and 64-Item ACPPE

36-item ACPPE (α = .90)				64-item ACPPE (α = .95)			
Concept	n	Items	α	Concept	n	Item	α
1. Internal work motivation	7	29 30 31 32 33 34 35	.87	1. Internal work motivation	7	29 30 31 32 33 34 35	.87
2. Interpersonal interaction	7	14 18 19 20 21 22 27	.70	2. Interpersonal interaction	7	14 18 19 20 21 22 27	.79
3. Control over practice	5	6 7 8 10 11	.81	3. Control over practice	5	6 7 8 10 11	.81
4. Handling conflict	5	23 24 25 26 28	.73	4. Conflict Management	7	23 24 25 26 28 52 53	.79
5. Autonomy	5	1 2 3 4 5	.72	5. Autonomy	5	1 2 3 4 5	.72
6. Communication about patient care information	3	15 16 17	.71	6. Communication about patient care information	3	15 16 17	.71
7. Supportive leadership	2	9 12	.77	7. Supportive leadership	3	9 12 66	.83
8. Cultural sensitivity	2	38 37	.68	8. Nursing care	5	37 38 39 40 57	.73
				9. Relationship between staff nurses and physicians	5	13 42 43 44 46	.88
				10. Support for nursing professional development	6	58 59 60 61 62 63	.85
				11. Patient surveillance	6	45 47 48 49 50 51	.80
				12. Support for professional practice	5	41 55 56 64 65	.73

Summary

Upon the closer examination the psychometric structures among the original 38-item English PPE Scale, the 36-item ACPPE, and the 64-item ACPPE, the results indicated that no matter if new items were or were not added in to the PPE Scale, most of the original PPE items' factor-loading pattern changed in a different culture. Only one component of the PPE Scale, Internal Work Motivation, was found to be always underpinned by the same PPE items across different cultures. Whether it was respondent from the same culture or across different cultures, adding new items into an existing scale could produced new concepts of measurement which were not included in the original PPE Scale but were important to the Taiwanese culture, such as Support For Nursing Professional Development, Patient Surveillance, and Support For Professional Practice factors. Adding new items could also somehow change the meaning of an existing component. For example, the original Culture Sensitivity factor appeared across culture but latter transformed into Nursing Care factor after new items added. When the new added items clustered with translated-adapted items, the items' original meaning related to cultural sensitivity became ambiguous across culture and the interpretation of the new factor became difficult.

Items Refined for Cross-Culturally Research

Through the above comparison of psychometric properties among 36-Item ACPPE, 64-Item TACPPE and the original 38-Item PPE, the researcher noted that those added items brought new concepts into the PPE Scale and change the meaning of some

components; and the items' factor loading pattern and the meaning of components changed across culture. These results raised the researcher's concern about the usability of the added items.

In order to facilitate the utility of a scale in different culture, as well as investigate cross-cultural comparison, the researcher decided to further cross-culturally refine the PPE Scale. Laying a solid foundation from the psychometric results of the original 38-item PPE Scale, the 36-item ACPPE and the 64-item ACPPE, the researcher used the cross-culturally adapted 64-item scale as prototype to refine the PPE Scale. To pursue a refined scale that could capture the constructs common across culture and specific to Taiwanese culture to best measure the professional practice environment for nurses, the researcher carefully reviewed the new added items along with the original PPE items and selected useful items to create a new scale for psychometric evaluation.

Finally, all five items in the Nursing care factor (Items 36, 37, 38, 39, 40, 57) were excluded because the concepts among the five items were incongruent and the meaning of the 5 items' grouping was difficult to interpret. For example, Item 37, 38, and 57 were used to measure cultural sensitivity. Item 39 was created to measure control over practice. Item 40 was created to measure autonomy in clinical practice. One item (Item 52) in the Conflict Management was excluded due to the borderline high inter-item correlation (r = .79) between Item 53 and Item 52, indicating that these two items might be overlapping and redundant. Finally 58 items including 35 original PPE items and 23 new added items were recruited for factor analysis.

Psychometric Evaluation of the 58-Item ACPPE

Initial Item Analysis and Reliability Estimates

On a 4-point scale, where 1= *strongly disagree* to 4= *strongly agree,* the mean scores of the 58 items of the translated-adapted Chinese version of the PPE Scale ranged from 2.31 (Item 8: *This unit has enough staff nurses to provide quality patient care.; Item 56: This hospital provides multilingual health care brochures/sheets for nurses in clinical practice.*) to 3.13 (Item 31: *I feel a high degree of personal responsibility for the work I do.*). An examination of the inter-item correlation matrix indicated that inter-item correlations ranged from a low of .0003 between Item 32, ″I have challenging work to motivate me to do the best job. ″, and Item 56, ″This hospital provides multilingual health care brochures/sheets for nurses in clinical practice. ″ to a high of .77 between Item 8, ″ This unit has enough staff nurses to provide quality patient care. ″, and Item 10, ″ This unit has enough staff nurses to get the patient care work done. ″. All items significantly correlated ($r \geq .30$) with at lease one other items in the matrix (range: 1-36). None of the inter-item correlations was greater than .80, thus indicating an absence of problems with multicollinearity and the wording and meaning of 58 item was not redundant (Pett, et al., 2003), although some items had very weak correlations with one another. The inter-item correlations supported that no item on the 58-item scale was redundant.

Cronbach's alpha. The Cronbach's alpha coefficient for the 58 items was .95. The corrected item-total correlations ranged from a low of .16 on Item 18 (This unit does not get the cooperation that it needs from other hospital units.) to a high of .64 on Item 43 (In

this unit, doctors recognize nurses' contributions to patient care.). All but five items (Item 14, 18, 22, 27 and 56) on the 58-item scale had corrected item-total correlation greater than .30. All items were retained for preliminary factor analysis to reduce the risk of accidentally dropping potentially important items, because items with lower correlation coefficients might be derived from that the 58 items were treated as a single dimension scale rather than a multi-dimensional scale while computing corrected item-total correlations (DeVellis, 1991; Kline, 1999).

PCA for the 58-Item ACPPE

The 58 items produced by recruiting 33 original PPE items and 25 new added items were next subjected to PCA with Varimax rotation and Kaiser normalization. Data selected by excluding cases listwise indicated that with 931 subjects included and 58-item tool used, there was a ratio of 16 subjects per item.

Prior to performing principal component analysis, the suitability of using factor analysis for the data was first assessed by using Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) and Bartlett's Test of Sphericity. The KMO value was .94 and Bartlett's Test of Sphericity was significant ($\chi^2 = 25308.00$, $p =. 00$). These results supported the use of factor analysis for the data.

The initial Principal component analysis without rotating components revealed the presence of twelve components with eigenvalues greater than 1, together accounting for 60.66% of the overall variance between items. However, an inspection of the Scree Plot suggested that 8, 9, 10, 11, and 12-factor solution should be examined. Multiple runs

of factor analysis using different extraction methods with Varimax or direct Obliminand by forcing the number of factors into 8 through 12 components were performed. The factor analysis results indicated the 11-factor solution, produced by using PCA with Varimax rotation and forcing the number of factors into 11, was the most interpretable.

PCA with Varimax rotation with forcing the number of factors into eleven components revealed an 11-component solution with eigenvalues greater than 1, together accounting for 58.93% of the overall variance between items. The communalities for the 58 items ranged from .44 to .76. All 58 items loaded greater than .30 on one of the eleven components. A parsimonious and interpretable solution with 11 components was obtained by assigning items based on the six critical criteria which included: (a) item-factor loading of at least .30, (b) item to total scale coefficient of at least .30 within the assigned component, (c) internal consistency of each component, (d) interpretability of the component. (e) item's meaning relative to the other items, and (f) item's potential cultural meaning to Taiwanese nurses (Nunnally, & Berstein, 1994; Pett et al., 2003; Hambleton, 2001; Kristjansson et al., 2003).

Components of the 58-item ACPPE. The 11 components emerging from the 58-item scale were as the same as the components of the 64-item ACPPE, except for the Nursing Care factor. Component 1, with an eigenvalue of 15.28, consisted of five items and accounted for 7.75% of variance. Component 2, with an eigenvalue of 3.45, consisted of seven items and explained 7.31% of variance. Component 3, with an eigenvalue of 2.76, consisted of six items and explained 6.48% of variance. Component 4, with an

eigenvalue of 2.28, consisted of five items and explained 6.13% of variance. Component 5 through 11 with eigenvalues of, 1.98, 1.78, 1.66, 1.44, 1.25, 1.22, and 1.08 accounted for 5.74%, 5.03%, 4.55%, 4.44%, 4.33%, 3.79%, and 3.39% of variance, respectively (see Table 35).

The component 1 through 11 was named as Relationships between Staff Nurses, Internal Work Motivation, Support for Nursing Professional Development, Control Over Practice, Interpersonal Interaction, Conflict Management, Patient Surveillance, Supportive Leadership, Autonomy, and Support for Professional Practice, respectively. The descriptions of the concepts underpinning the 58-item ACPPE were summarized in Table 36.

Table 35

PCA Factor Loadings for the 58-Item ACPPE (N=931)

Factor 1: Relationships between staff nurses and physicians **Eigenvalue = 15.28** **% of variance explained = 7.75** **Cronbach's Alpha = .88**											
Item (n=5)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
44. In this unit, doctors communicate well with nurses.	.79										
43. In this unit, doctors recognize nurses' contributions to patient care.	.75										
42. In this unit, doctors and nurses respect each others' profession.	.75										
13. There are good working relationships between doctors and nurses in this unit	.64										
46. In this unit, doctors discuss patients' condition and care with nurses.	.60										

Table 35 (continued)

Factor 2: Internal work motivation **Eigenvalue = 3.45** **% of variance explained= 7.31** **Cronbach's Alpha = .87**											
Item (n=7)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
32.I have challenging work to motivate me to do the best job.		.80									
34.I am motivated to do the best job because I am empowered by my work environment.		.74									
33.Working in this unit gives me opportunity to gain new knowledge and skills..		.72									
35.Working in this environment increases my feeling of professional growth		.72									
31.I feel a high degree of personal responsibility for the work I do.		.70					.32				
30.I feel a great sense of personal satisfaction when I do the job well.		.67									
29.My self-appraisal goes up when I work in this unit.		.50									

Table 35 (continued)

Factor 3: Support for nursing professional development **Eigenvalue = 2.76** **% of variance explained = 6.48** **Cronbach's Alpha = .85**											
Item (n=6)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
60. I receive adequate in-service/continuous education.			.70								
59. There are experienced nurses serving as preceptors to guide the new nurses in t his unit..			.66								
62. This unit support nurses to attend conferences or professional activities			.65								
63. When nurses in this unit perform researches or improvement projects, they adequately get necessary resources.			.60								
61. This unit supports nurses to returns to school for degrees.			.58								
58. New nurses in this unit receive adequate orientation.			.54								

Table 35 (continued)

Factor 4: Control over practice **Eigenvalue = 2.28** **% of variance explained = 6.13** **Cronbach's Alpha = .81**											
Item (n=5)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
8. This unit has enough staff nurses to provide quality patient care.				.78							
10.This unit has enough staff nurses to get the patient care work done.				.76							
6. This hospital has enough support services such as social services department, transferring center, medical affairs division, etc. to allow me to spend time with patients.				.60					.30		
7. I have sufficient time and opportunity to discuss patient care problems with other staff.				.55					.34		
11.Staff nurses have the opportunity to work in highly specialized patient care unit.				.47							

Table 35 (continued)

Factor 5: Interpersonal interaction **Eigenvalue = 1.989** **% of variance explained = 5.74** **Cronbach's Alpha = .79**											
Item (n= 7)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
21.When staff nurses in this unit disagree, they ignore the problem and pretend that the problem will go away.					.71						
19.Other hospital units seem to have a low opinion of this unit.					.70						
20.Inadequate working relationship with other hospital groups limits the effectiveness of work in this unit.					.70						
27. In this unit, disagreements between staff nurses are ignored or avoided.					.66						
18.This unit does not get the cooperation that it needs from other hospital units.					.63						
22.Staff nurses in this unit withdraw from conflict.					.59						
14. In this unit, I am asked to do things against my professional judgment.					.57						

Table 35 (continued)

Factor 6: Conflict management **Eigenvalue = 1.78** **% of variance explained = 5.03** **Cronbach's Alpha = .75**											
Item (n=6)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
26. The experience and professional knowledge of staff nurses in this unit contribute to achieve the high quality solution.						.68					
24. All staff nurses in this unit work hard to reach the best possible solution.						.64					
28. The staff nurses involved settle the disagreement by consensus.						.53					
25. In this unit, the staff nurses involved do not settle disagreement until they are all satisfied with the decision.						.49				.34	
23. In this unit, all points of views are considered in finding best solution to problems.				.35		.47					
53. In this unit, nurses help one another to achieve work goals			.30			.43	.31				

Table 35 (continued)

Factor 7: Patient surveillance **Eigenvalue = 1.66** **% of variance explained = 4.55** **Cronbach's Alpha = .80**											
Item (n=6)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
48. In this unit, when the patient's condition changes, nurses quickly inform the involved medical staff in charge of the patients.							.72				
49. In this unit, nurses know very well their patients' conditions						.30	.61				
47. I am able to easily contact the relevant medical staff in charge of the patients.	.39						.58				
50. In this unit, nurses give complete and accurate information about patients to colleagues during nursing shift report.						.42	.51				
51. This hospital has sound information systems to rapidly transfer patients' relevant information to the involved staff.							.46				
45.In this unit, when nurses inform doctors about patient's health problems, doctors manage the problem effectively.	.59						.36				

Table 35 (continued)

Factor 8: Supportive leadership **Eigenvalue = 1.44** **% of variance explained = 4.44** **Cronbach's Alpha = .83**											
Item (n=3)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
9. Head nurse in this unit is a good manager and leader.								.75			
12. Head nurse in this unit backs up staff nurses' decisions even they are in conflict with doctors								.74			
66 Head nurse supports staff nurses in the unit								.69			

Table 35 (continued)

Factor 9: Autonomy **Eigenvalue = 1.25** **% of variance explained = 4.33** **Cronbach's Alpha = .72**											
Item (n=5)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
2. In this unit, nursing controls its own professional practice.									.66		
5. In this unit, patient care assignments facilitate the continuity of patient care.									.58		
3. I have freedom to make important patient care and work decisions.									.56		
1. Leadership supports nursing.								.30	.54		
4. There is a lot of teamwork between staff nurses and doctors.	.37								.53		

Table 35 (continued)

Factor 10: Support for professional practice **Eigenvalue = 1.22** **% of variance explained = 3.79** **Cronbach's Alpha = .73**											
Item (n=5)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
55. This hospital provides interpretation services to facilitate the communication between nurses and patients.										.72	
56. This hospital provides multilingual health care brochures/sheets for nurses in clinical practice										.62	
64. The quality and quantity of the collections in this hospital's library meet my learning needs.				.37						.46	
41. The administrators in this hospital value staff nurses' opinions.				.34				.31		.36	
65. The quality and quantity of the health care facilities in this unit meet my needs in caring patients.			.39	.44						.30	

Table 35 (continued)

Factor 11: Communication about patient care information

Eigenvalue = 1.08

% of variance explained = 3.39

Cronbach's Alpha = .71

Item (n=3)	Factor										
	1	2	3	4	5	6	7	8	9	10	11
15.I get information about patient's status when I need it.											.78
16.When patient's status changes, I get relevant information quickly.											.70
17.This unit has good working relationships with other groups in this hospital.	.31										.45

Table 36

Descriptions of Concepts underpinning the 58-Item ACPPE

Concept	Definition	n	α	M^a	M^b
1. Relationship between staff nurses and physicians	The association between staff nurses and physicians that facilitates the communication and the collaboration of quality patient care between professional disciplines.	5	.88	.59	.72
2. Internal work motivation	Self-generated encouragement and commitment to work completely independent of external factors such as pay, supervision and co-workers (Hackman & Oldham, 1976, 1980; Ives Erickson, 2000).	7	.87	.49	.65
3. Support for nursing professional development	The degree to which nurses are supported by the organization to participate learning activities that assist in developing and maintaining competence, enhance professional practice, and support the achievement of career goals.	6	.85	.49	.63
4. Control over practice	Sufficient intra-organizational status to influence others and to deploy resources when necessary for good patient care (Aiken, Havens, & Sloane, 2000; Ives Erickson, Hamilton, Jones, & Ditomassi, 2002).	5	.81	.45	.60
5. Interpersonal interaction	Ability of the staffs on a unit to work with each other and with other units to solve problems when there are different opinions or judgments.	7	.79	.35	.52

Note. M^a = average of inter-item correlations; M^b = average of item-to- total scale correlations.

Table 36 (continued)

Concept	Definition	n	α	M^a	M^b
6. Conflict Management	Staff nurses working together collaboratively to handle conflict in order to provide quality patient care.	6	.75	.34	.49
7. Patient surveillance	Prevention of adverse events, risk identification, early response to changes in patients' condition and implementation of interventions to rescue and restore the patients to health.	6	.80	.41	.56
8. Supportive leadership	Nurses' perceptions about the manager's ability and management style to create an environment that facilitates nursing care.	3	.83	.63	.70
9. Autonomy	The quality or state of being self-governing and exercising professional judgment in a timely fashion (Aiken et al., 1997).	5	.72	.35	.49
10. Support for professional practice	An organization's ability to provide adequate resources for nurses to function effectively to provide quality patient care.	5	.73	.35	.49
11. Communication about patient care information	The degree to which patient care information is related promptly to the people who need to be informed through open channels of communication Shortell, Rousseau, Gillies, Devers, & Simons, 1991).	3	.71	.46	.53

Note. M^a = average of inter-item correlations; M^b = average of item-to- total scale correlations.

Item analysis and reliability estimation for PCA-derived scales of the 58-item ACPPE. The Cronbach's Alpha, corrected item-to-total scale correlations, and inter-item correlations within the PCA-derived scales of the 58-item translated-adapted Chinese version of the PPE Scale were examined. Cronbach's Alpha coefficients for the 11components and the total scale were computed to examine internal consistency. As shown in Table 36, the 58-item scale had an overall alpha coefficient of .95. For Component 1 through 11 the Cronbach's alpha coefficient
was .88, .87, .85, .81, .79, .75, .80, .83, .72, .73, and .71, respectively.

The examination of each component's inter-item-correlations matrix indicated that the majority of the inter-item correlations within each component were greater than .30 and less than .80, although some items within the components were moderately inter-correlated ($.20 < r < .30$). Six components had items with inter-item- correlations less than .30, including Internal Work Motivation (range: .28 to .68), Interpersonal Interaction (range: .22 to .53), Conflict Management (range: .16 to .48), Support for Professional Practice (range: .23 to .54), Patient Surveillance (range: .26 to .59), Autonomy (range: .24 to .41). The inter-item correlation between Item 29 and Item 31 was .28 within Internal Work Motivation factor. Within Interpersonal Interaction factor, the inter-item correlation was .22 between Item 18 and Item 22; .25 between Item 14 and Item 22; .26 between Item 19 and Item 22; .27 between Item 14 and Item 27; and .29 between Item 20 and Item 22. Within Conflict Management factor, the inter-item correlation was .16 between Item.25 and Item 53; .25 between Item 24 and Item 28; .26

between Item 23 and Item 53; and .29 between Item 23 and Item 28. Within Support for Professional Practice factor, the inter-item correlation were .23 between Item 56 and Item 65; .26 between Item 56 and Item 64; .27 between Item 41 and Item 56; .29 between Item 55 and Item 65. The inter-item correlation was .26 between Item 45 and Item 48 within Patient Surveillance factor and .24 between Item 1 and Item 4 within Autonomy factor. Although the above items within their component had an inter-item correlation less than .30, all the 58 items except Item 25 (r =.29) had an average inter-item correlation greater than .30. As shown in Table 36, the average of inter-item correlations for Component 1 through 11 was .59 .49, .49, .45, .35, .34, .41, .63, .35, .35, and .46, respectively. These indicated that the items within each component were somehow correlated but not redundant.

The average of item-to-total scale correlations for Component 1 through 1 was .72, .65, .63, .60, .52, .52, .49, .56, .70, .49, and .53, respectively, (see Table 36). All item-to- total scale correlations within each component were greater than .30 and less than .80. These results supported that items within each component were significantly inter-correlated but not redundant and describe meaningful aspects of the component (Nunnally, & Berstein, 1994).

Table 37 showed that the mean for the 11 subscales of the 58-item translated-adapted Chinese version of the PPE Scale ranged from 2.47 (Support for professional practice) to 2.96 (Internal work motivation). The correlations among the component-based scales ranged from .10 between Interpersonal Interaction factor and

Support for Professional Practice factor to .61 between Patient Surveillance factor and Relationship Between Nurses and Physician factor. No inter-correlation among the 11 factors was greater than .80, thus indicating that the extracted factors were not redundant.

Test-retest reliability of the 58-item ACPPE. Among the samples of Taiwanese nurses recruited in this study, nurses working on five units of a surveyed hospital were specially selected as a sub-sample for constructing the test-retest reliability. These nurses were asked to fill out the same survey twice at a 2-week interval. The data from the two surveys at a 2-week interval were used for analyses. The test-retest reliability was evaluated by computing Paired *t* tests, Wilcoxon Signed Rank test, Pearson correlation, and Intra-class Correlation Coefficients (ICC) between the scores of the 11 subscales and the total scale at the 2-week interval. To test the difference between the scores of the total scale and the 11 subscales at the 2-week interval, Paired *t* test were used for data with normal distribution and Wilcoxon Signed Rank test was used for data with significant skewness. Because 12 pairwise comparisons were computing, Bonferroni correction (.05/12) was used to prevent the chance of Type I error (Munro, 2006); thus a *P* value of .004 was considered significant.

Table 37

Correlations Coefficients of Eleven Components of the 58-Item ACPPE (N=931)

Component	*M*	*SD*	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
F1. Relationship between nurses and physicians	2.73	.51	1.00										
F2. Internal work motivation	2.96	.43	.43	1.00									
F3. Support for professional development	2.95	.42	.47	.49	1.00								
F4. control over practice	2.54	.55	.52	.31	.45	1.00							
F5. Interpersonal interaction	2.60	.46	.23	.23	.31	.11	1.00						
F6. Conflict management	2.84	.34	.53	.45	.52	.48	.15	1.00					
F7. Patient surveillance	2.93	.35	.58	.50	.57	.41	.24	.57	1.00				
F8. Supportive leadership	2.87	.58	.44	.36	.49	.41	.24	.48	.36	1.00			
F9. Autonomy	2.94	.40	.54	.43	.48	.54	.27	.46	.45	.37	1.00		
F10. Support for professional practice	2.47	.51	.50	.32	.55	.51	.10	.48	.40	.43	.36	1.00	
F11. Communication about patient care information	2.87	.40	.51	.37	.44	.50	.19	.46	.47	.35	.47	.38	1.00

As shown in Table 38, there was no significant difference between the scores of the total scale and 10 of the 11 subscales at the 2-week interval ($p > .004$), except the subscale, Interpersonal Interaction ($p = .002$). However, the scores of the 11 subscales and the total scale were significantly correlated at the 2-week interval ($p<.001$). The Pearson correlation coefficient ranged from .39 (Autonomy) to .69 (Relationship Between Staff Nurses and Physicians) for the eleven subscales and was .79 for the total scale. The ICC (1,1) was .79 for the total scale and ranged from .40 (Autonomy) to .70 (Relationship Between Staff Nurses and Physicians) for the eleven subscales. These findings supported that the total scale for the 58-item translated-adapted Chinese version of the PPE Scale haD good test-retest reliability.

Concurrent validity for the 58-item ACPPE. The four item scale on the demographic sheet which separately measured nurses' perceptions about satisfaction for current nursing job, satisfaction for working on the unit, considering working on other hospital, and considering not working as a nurse any more, were also used to test the concurrent validity of the 58-item ACPPE.

A 5-point Likert scale, where 1= very *dissatisfied* to 5= very *satisfied,* was applied to measure nurses' perceptions about satisfaction for current nursing job and satisfaction for working on the unit. Another 5-point Likert scale, where 1= *never consider* to 5= *always consider,* was used to measure nurses' perceptions about considering working Iin another hospital, and considering not working as a nurse any more.

Table 38

Test Retest Reliability of the Eleven Subscales and Total Scale of the 58-Item ACPPE

Score	n	*M*	*SD*	*t*	*r*	ICC $_{(1,1)}$
Internal work motivation	78					
Time 1		3.01	0.36	0.78	.59**	.60
Time 2		2.98	0.38			
Interpersonal interaction	78					
Time 1		2.79	0.43	3.25*	.58**	.54
Time 2		2.64	0.46			
Control over practice	79					
Time 1		2.67	0.50	-2.25	.62**	.59
Time 2		2.77	0.43			
Conflict Management[a]	79					
Time 1		2.90	0.26	0.06	.47**	.52
Time 2		2.89	0.30			
Autonomy	78					
Time 1		3.04	0.35	0.80	.40**	.39
Time 2		3.01	0.31			
Supportive leadership[a]	78					
Time 1		2.96	0.46	2.30	.53**	.51
Time 2		2.84	0.49			

Note. [a] Wilcoxon Signed Rank test was performed; * p< .004; ** p<.001

Table 38 (continued)

Score	n	*M*	*SD*	*t*	*r*	ICC $_{(1,1)}$
Communication about patient care information	79					
Time 1		2.98	0.36	-0.73	.61**	.61
Time 2		3.00	0.34			
Relationship between staff nurses and physicians[a]	78					
Time 1		2.85	0.45	-1.18	.70**	.69
Time 2		2.90	0.39			
Support for nursing professional development	79					
Time 1		3.01	0.39	1.34	.56**	.56
Time 2		2.95	0.41			
Patient surveillance	78					
Time 1		3.00	0.38	0.12	.60**	.59
Time 2		2.99	0.29			
Support for professional practice [a]	79					
Time 1		2.54	0.45	-1.21	.62**	.62
Time 2		2.60	0.46			
Total scale	75					
Time 1		2.95	0.27	1.44	.79**	.79
Time 2		2.92	0.27			

Note. [a] Wilcoxon Signed Rank test was performed; ** p<.001

On a 5-point scale, the mean of satisfaction for current nursing was 3.09 and the mean for satisfaction for working on the unit was 2.49. The mean responses to the question of considering working in another hospital was 3.02 and the mean responses to the question of considering not working as a nurse any more was 3.30.

The Person correlation coefficients between the scores of subscales and the total scale and the scores of nurses' perceptions about satisfaction for current nursing job, satisfaction for working on the unit, considering working in another hospital, and considering not working as a nurse any more were calculated.

As shown in Table 39, the 11 subscales' mean scores and the total scale' s mean score of the 58-item ACPPE were significantly and positively correlated with the scores of nurses' perceptions about satisfaction for current nursing job and satisfaction for working on the unit ($p < .01$). The significant positive correlation coefficients indicated that the higher perceived professional practice environment was, the higher perceived satisfaction for current nursing job and for working on the unit was.

.

Table 39

Pearson Correlations between Scores of the 58-Item ACPPE and Scores of Nurse's Satisfaction (N=913)

	Criterion items	
Scores	Satisfaction for current nursing job	Satisfaction for working on the unit
Internal work motivation	0.36**	0.35**
Interpersonal interaction	0.25**	0.27**
Control over practice	0.31**	0.34**
Conflict Management	0.25**	0.29**
Autonomy	0.31**	0.29**
Communication about patient care information	0.21**	0.24**
Supportive leadership	0.21**	0.25**
Relationship between staff nurses and physicians	0.29**	0.28**
Support for nursing professional development	0.34**	0.31**
Patient surveillance	0.29**	0.31**
Support for professional practice	0.26**	0.23**
Total scale	0.43**	0.43**

Note. ** p<.01

As shown in Table 40, Person correlation coefficients showed that the correlation between the eleven subscales' mean scores and the total scale' s mean score of the 58-item ACPPE. The mean scores of nurses' perceptions about considering working in other hospital, and considering not working as a nurse any more, were significantly and negatively correlated ($p < .01$). The significant negative correlation coefficients suggested that the less perceived professional practice environment was, higher perceived working in another hospital and not working as a nurse any more was.

All of these findings converged on the evidence that the 58-item translated-adapted Chinese version of the PPE Scale had satisfactory concurrent validity.

Summary

The results showed that the 58-item ACPPE could demonstrate a satisfactory psychometric structure through PCA with Varimax rotation and had acceptable internal consistency, test-retest reliability and concurrent validity. The results supported to accepting the tested research hypothesis for Research question 2 that IS the 58-item ACPPE could demonstrate acceptable psychometric properties in a sample of Taiwanese nurses working in acute care settings

Table 40

Pearson Correlations between Scores of the 58-Item ACPPE and Scores of Nurse's Intent to Leave (N=913)

	Criterion items	
Scores	Considering working on other hospital	Considering not working as a nurse any more
Internal work motivation	-0.19**	-0.21**
Interpersonal interaction	-0.21**	-0.19**
Control over practice	-0.29**	-0.14**
Conflict Management	-0.22**	-0.11**
Autonomy	-0.19**	-0.14**
Communication about patient care information	-0.21**	-0.10**
Supportive leadership	-0.24**	-0.12**
Relationship between staff nurses and physicians	-0.24**	-0.21**
Support for nursing professional development	-0.25**	-0.09**
Patient surveillance	-0.20**	-0.15**
Support for professional practice	-0.24**	-0.15**
Total scale	-0.33**	-0.22**

Note. ** p<.01

Answers for Research Question 3

The third research question of this study was: To what extent do selected demographics explain Taiwanese nurses' perceptions of their professional practice environment? To answer this question, two multiple regression analyses were performed.

Multiple Linear Regression with Demographic Variables

Multiple linear regression analysis was first performed to identify the multiple correlations of the selected demographic variables and the total score of the 58-item translated-adapted Chinese version of the PPE Scale. For multiple regression analysis, the outcome variable was the total score of the 58-item translated-adapted Chinese version of the PPE Scale; which was a continuous variable. There were twelve demographic variables selected as predictors. Four of the predictors were continuous variables including age, months of being a nurse, months of working on the unit, and months of working in the hospital. The other eight predictors were categorical variables including martial status, educational degree, work position, studying for a degree, rank, work unit, salary as a major source of family income, and monthly salary.

Data Management

All continuous demographic variables were checked for normal distribution to judge the appropriateness of computing multiple regression analysis. Four continuous predictors were significantly skewed. Transformations performed failed to correct the four significantly skewed continuous variables, so these four skewed continuous variables were dummy coded as dichotomous variables and for multiple regression

analysis. The eight categorical demographic variables were also dummy coded as dichotomous variables for multiple regression analysis.

The 12 predictors that were dummy coded as a dichotomous variable included age (0 = 26 years old or younger and 1 = 27 years old or older), months of being a nurse (0 = 48 months or less and 1 = 49 months or longer), months of working on the unit (0 = 48 months or less and 1 = 49 months or longer), months of working in the hospital (0= 48 months or less and 1 = 49 months or longer), martial status (0 = single and 1 = married sometime in life), educational degree (0 = diploma and 1 = BSN or higher), work position (0 = nursing specialist and 1= staff nurses), studying for a degree (0 = no and 1 = yes), rank (0 = N1 or less and 1 = N2 or higher), work unit (0 = non-ICU and 1 = ICU), salary as a major source of family income (0 = no and 1 = yes), and monthly salary (0 = 40’000 NT or less and 1 = 40’001 NT or higher).

Result of Multiple Linear Regression with Demographic Variables

Multiple linear regression with enter method was used for data analysis. The twelve predictors were entered in a set. The analysis of variance (ANOVA) table indicated that the overall analysis of the twelve predictors was significant ($p = .025$). The Coefficients output indicated that only one of the twelve predictors, which was educational degree, was significantly correlated with the outcome variable ($p < .05$). The results indicated that participants who owned BSN or higher degree were more likely to repost higher score on the 58-item translated-adapted Chinese version of the PPE Scale.

The model Summary indicated that $R = .17$, $R^2 = .028$, adjusted $R^2 = .014$. All the

twelve demographic variables together accounted for 1.4% of the variance of the total score of the 58-item ACPPE (see Table 41).

Table 41

Multiple Linear Regression for Demographic Variables Predicting the Total Score of the 58-item ACPPE (*N*= 819)

Variables	β	t	Sig.
Months of being a nurse	-0.01	-0.09	0.93
Months of working on the unit	0.11	1.60	0.11
Months of working in the hospital	-0.13	-1.68	0.09
Age	-0.08	-1.44	0.15
Marital status	0.06	1.37	0.17
Educational degree	0.09	2.55	0.01*
Studying for a degree	0.06	1.64	0.10
Monthly salary	-0.04	-1.13	0.26
Salary as a major source of family income	-0.06	-1.69	0.09
Rank	0.07	1.40	0.16
Work position	-0.02	-0.56	0.58
Work unit	-0.01	-0.41	0.68

Note. Dependent variable was the total score of the 58-iteam translated and adapted Chinese version of the PPE Scale, $R = .17$, $R^2 = .028$, adjusted $R^2 = .014$, and * $p < .05$

Results of Content Analysis on Comments

To gain a better understanding of nurses' responses to the items of the scale in the survey and to allow nurses to respond to the areas not included in the survey items, one semi-structured question was used in this study to gather staff nurses' general perceptions of their practice environment. Content analysis was used to identify the key themes from nurses' comments on the open-ended question, ″In general, what are your thoughts on the current nursing practice environment? ″. Only comments approved for release by the participants were used as exemplars for the report.

Demographic Characteristics of the Commenters

Of the 977 valid respondents, 482 (49.33%) wrote comments on the open-ended question. Approximately 50% of the respondents writing comments were from a medical center in Taiwan (see Table 42). The average age of the commenters was 27.82 years. The commenters had an average of 73.88 months of working as registered nurses, an average of 50.50 months of working on the unit and an average of 56.26 months of working in the hospital. The demographic characteristics among the respondents were similar (see Table 43). Most commenters agreed to allow the research to quote their comments for publication. Of the 482 respondents, only 31 (2.7%) did not release the permission to quote their comments for the report.

Table 42

Sources of Commenters as Compared with Entire Sample

Settings		*Total Sample (N= 977)*		*Commenters (N= 482)*	
Hospital	Capacity *	*n*	*%*	*n*	*%*
A [a]	921	560	53.8	267	55.4
B [b]	600	210	21.5	94	19.5
C [b]	688	187	19.1	99	20.5
D [b]	400	54	5.5	22	4.6

Note. [a] : medical center; [b] = regional teaching hospital; * number of beds was the unit

Table 43

Selected Demographic Characteristics of Commenters as Compared with Entire Sample

	Total Sample (N= 977)	*Commenters (N= 482)*
Variables	*M (SD)*	*M (SD)*
Age	27.69 (4.40)	27.82 (4.37)
Months of being a nurse	71.82 (54.23)	73.88 (54.31)
Months of working on the unit	50.26 (41.47)	50.50 (41.18)
Months of working in the hospital	54.61 (44.67)	56.26 (45.83)

Themes Abstracted from the Comments

Of the 482 commenters, there were only 19 nurses (3.9%) wrote positive comments about the professional practice environment. Most commenters wrote negative comments related to their practice environment. The comments were often written in few words or short sentences without detailed relevant exemplars. A few comments were

written in a paragraph format with examples provided as related to the issues being described. Through synthesizing participants' comments, two major themes emerged from the data: (1) When the environment of care is perceived by nurses to be compromised, patient quality of care is threatened; and (2) When the environment of care is not supportive to professional nursing practice, nurse satisfaction and retention decrease.

Theme 1: When the Environment of Care Is Perceived by Nurses to Be Compromised, Patient Quality of Care Is Threatened

Working in the current practice environment, many nurses perceived that they had difficulty in fulfilling their professional role. Nurses complained that they were unable to provide quality patient care because the environment prevented nurses from performing professional patients care. Nurses indicated the environment of care was compromised by five factors: (1) poor nurse staffing, (2) work overload, (3) too many non-nursing tasks, (4) inadequate resources for patient care, and (5) de-specialized unit. Nurses commented that patient quality of care decreased within the compromised environment of care because nurses were unable to well utilize their professional knowledge and skills in clinical practice, give patient adequate health education, or spend adequate time with patients, and provide comprehensive patient care. The focus on the task for nurses was to ″get the job done″.

Poor nurse staffing. Many nurses commented that they were suffering from the constrained nursing manpower derived from the cost control of their hospitals. Nurses

often stated ″insufficient nurses″ or ″manpower shortage″. Nurses indicated that they were assigned to take care of too many patients due to the shortage of nurses on their unit. Nurses commented that the nurse staffing in their hospital was driven by cost control rather than patient acuity. Nurse staffing was adjusted by the floating bed-occupancy rate without taking the patient acuity into account. According to the floating bed-occupancy rate, nurses were randomly asked to work or get off the duty. Sometime, nurses were even suddenly assigned to work on other unit which they were not familiar with in order to solve the problem of nurse staffing on other unit. Nurses noted that they were unable to provide appropriate patients care due to the poor staffing. Nurses commented:

> ″The 62 beds are fully occupied everyday. 5 nurses are in the day shift, 4 nurses are in the evening shift, and 3 nurses are in the night shift. There is no professional work environment to speak of! Quality care is not the goal. It is definitely profit-oriented.″
>
> ″[nurses] still need to assist other non-related units, there is no profession (not familiar with the supported units)”
>
> ″nurses at the wards take care too many patients, especially take care more severe patients. The manpower on the unit is insufficient. When the number of patients on the unit is not enough, the nursing manpower will then be cut off. Nurses are really unable to give a complete health instruction to each of the patients, not to mention the patient’s replied-demonstration for the health instruction. Seldom get off the duty on time. Often delay for one to two hours (really very busy). ″

Work overload. Due to the constrained nursing manpower, nurses felt they were assigned added work. Nurses complained that because of a heavy workload they could not get off their duty on time. Because of work overload, nurses could only provide

patient ″routine care″. Workload limited nurse's time with patients and compromised quality patient care. Some nurses commented:

> ″Work load is heavy, need to take care of 8-12 patients in the day duty. Injections, distributing the drugs, taking vital sign, by order to work, there is no profession at all. It's not mentioned to have the time to discuss with doctors about the treatment and care for patients.″

> ″Taiwan's nursing work environment does its best to squeeze nurses. Everyday, the number of patients cared for, routine activities, and paper works, sum it up, it's very hard to just get the work done. It's impossible to perform all the professional nursing that included patient's physical, psychological, and spiritual care. For the 8 hours of work time, how much time could be spent in staying with patients and listening to them? ″

> ″Because taking care of lost of patients, nurses are often eager to complete the heavy and complicated work in a short time, can not spend more time with patients, this make the quality of care decline, often cause patients to complain. ″

> ″Communication is the most important thing for nursing to perform the profession…But the time for communication is not too much, the busy work makes nurses just want to finish the work and get off the duty on time (because it is primary care system, no remuneration for the overtime work), so the complaints from patient families increase, the cases of complaints increase. ″

Too many non-nursing tasks. Many nurse described that they had to do many activities not related to direct patient care. For example, a nurse said, ″too many chores. Can not really display nursing profession.″Nurses often stated that they did lots of ″chores″ and ″non-professional work″ such as ″reports″, ″computer operation″, ″writing nursing records″, and ″equipment inspection″. A nurse said, ″I feel that nurses have to get involved in too many things…that nurses need to manage patient's illness, living

environment, the equipment". Several nurses complained that their professional role became ambiguous because they were often asked to take over affairs not related to nursing discipline. As a nurse said, ″now, nurses have to take lots of works that nurses did not have to take over before.″ One nurse questioned, ″the duty for nurses or physicians is not clear defined…why should I do the work of doctors? ″. Commenters indicated that these non-nursing tasks took them way from taking care of patients, so nurses were unable to spend adequate time with patients. Some nurses said:

> ″Too many extra affairs (reports, records, computer operations), the time spent on patients decreased.″
>
> ″Paperwork for records is too complicated, it will reduce the direct-care time for patients; [nurse is] unable to meet patient's psychological, social and spiritual needs.″
>
> ″It's said that nursing is professional ", but in clinical settings, nurses perform not only the nursing care but also many chores, such as: making the beds, clean the beds, the lamps is out of function, toilets got stuck, air-condition is too strong or too noisy… all the kind of big or small chores are supposed to be related to nurses. If nurses do not do it well, or Doctors do not show up…all blame nurses. But [nurses] did not get more respect. Now, fewer and fewer people want to become a nurse. Not because everyone did not have the caring. It's only because this role was so squeezed that it is too tired. [Nurses] have to become patient's advocator very often, also have to urge doctors to quickly perform the treatment or write the order. It's too chaotic. Have to take the time to attend the in-service education, and also the reports… and so on. (sigh) There is still some pressure from the high-level. [nurse] Have to keep smiling face for patient, if not, then just wait for getting a complaint letter and being interviewed by the high-level leaders. ″

Inadequate resources for patient care. Some nurses indicated that adequate facilities, supplies, reference books or equipment were not always available for nurses in clinical care. As a nurse said, ″[hospital] demands good quality care but does not provide good facilities and settings.″ Some hospitals did not provide enough equipment for patient care. An ICU nurse even said, ″too few EKG monitors.″ The lack of resources for patient care prevented nurses from providing adequate patient care. For example, one nurse described, ″Someone should set up more monitors within the hospital; it's hard to monitor vital sign change when patient's condition is not good.″ Another nurse said, ″the hardware facilities are often insufficient or too old, can not be safely provided for patient″. Although some hospitals provided certain amount of supplies, reference books or equipment for staff nurses, nurses indicated that the quality of the resources still needed to be improved for better patient care. Nurses stated, ″the machines are too old″; ″reference books are too old and too few″; ″Need to take out the old equipment and buy the new equipment. A workman must first sharpen his tools if he is to do his work well.″

De-specialized unit. Unit's specialization facilitated nurses to provide specific care to patients and demonstrate the uniqueness of nursing. However, nurses noted that some units in their hospital were designed as mixed units. Nurses sated that the specialization of their unit was vanishing due to hospital's cost control strategies. Nurses indicated that in order to increase bed occupancy rate for profit, hospitals allowed patients to be admitted in some units where their diseases were not qualified for the specialization of the units. A nurse sated,

> ″Thought this is a specialized ward, because of the bed occupied rate, if too many beds are vacant, then patients of other departments will soon be admitted in. ″

Inability of maintaining the specialization the unit led to that the quality of patient care was unable to be ensured because nurses were forced to take care of patients whom they were not familiar with the relevant care for. Some nurses commented:

> ″Beds are often lent to other department, it is difficult to provide specialized care. When patients need to contact with that department, it's more difficult to immediately handle it/″

> ″Take care of too many patients, the ward is not much specialized, it's hard to maintain the level of care. ″

Theme 2: When the Environment of Care Is Not Supportive to Professional Nursing Practice, Nurse Satisfaction and Retention Decrease

Working in the environment of care, many nurses perceived that they were not supported. Nine subthemes abstracted from the data showed the professional nursing practice was not supported: (1) demanding working conditions, (2) poor welfare and salary, (3) inadequate resources for professional development, (4) unsafe work environment, (5) unsupportive managers, (6) poor nurse-physician relationship, (7) poor peer supports (8) nursing profession being devalued, and (9) limited nursing autonomy. According to the comments, the unsupportive environment of care led to dissatisfaction with quality of life and high turnover rate of staff nurses.

Demanding working conditions. Many nurses commented that they were often overloaded with tasks and could not get off the duty on time. The work schedule was not

flexible so nurses had to work in different shifts. In addition to taking care of patients, nurses were requested to attend many in-service education classes after they get off the duty. Nurses stated that working conditions for nurses were highly demanding. Some nurses said:

> ″Nursing work is busy but nurses also needs to work on 12-hour shift, after a long time, after a long time, the load goes beyond the body can take. ″
>
> ″Work is hard. Have to attend in-service education after get off the duty. It is more than 56 working hour per week, plus reports. Can not get off the duty on time and there is no bonus for overtime work. Have no quality of life. Executive staff work with normal schedule, but nurses need to be on called or ‘PI-PHAN’ [being asked to get off the duty at once].It’s totally inhumane. ″
>
> ″Nursing is a high-pressure job, in addition to the work, for profession, have to continuous learning and get in-service training. It’s right that getting knowledge help develop and expand the field, but nurses take three-shift duty and their body really takes certain pressure, it’s easy that physical and psychological aspects get exhausted. ″
>
> ″The beds were fully occupied everyday but no nurse is added on the unit. Nurses are so exhausted but are still assigned to attend classes. If nurses do not accumulate certain hours [for the lessons], then they can not get the year-end bonus!″

Poor welfare and salary. Many nurses addressed that their wage was not competitive or proportionate to work. As a nurse commented, ″work with high workload and high professionalism, but the pay can not reflect it.″ Nurses work so hard but still were unable did not get adequate compensation and reasonable welfare. Nurses commented:

> ″Salary is to little, often work more than 8 HR but without getting any compensation. ″

> ″Special units (such as ICU, dialysis room) has bonus, the salary is higher than general wards; and could get off the duty on time, have time to eat. But in some general wards… nurses are often so busy that they do not have time to eat, work long hours but get same pay as compared to the easy general wards, the salary is less than some special unit like ICU, it's quite unfair. There is a big difference between the income for nurses and doctor, but the workload and work time is not less than physicians. work time is long, very seldom to get the overtime pay. ″

Inadequate resources for professional development. Many nurses described that their hospital paid attention to nursing professional development. However, adequate resources to promote, on-the-job learning and in-service education were not available. Nurses had to sacrifice their off days for joining the relevant academic activities in their hospital without any reimbursement. Some nurses said, ″have to using personal days off for the in-service trainings. I feel very dissatisfied, sometimes have continued to work after class, very tired″; ″the time for in-service education is not well arranged, for example, 1:30 pm ~ 3pm, people working in the evening shift can not attend the classes. too many paper reports.″ Nurses also noted that the resources for promotion were insufficient. Nurses stated: ″There is a lack of guidance for writing the report for promotion, if the guidance provided, participants must pay and the fee is not cheap, so it makes people not want to participate″; ″the road for pursuing further education is narrow″; ″the clinical ladder system should be more improved″; ″there is no organized nursing professional in-service education for nurses to enhance their quality″.

Unsafe work environment. Some nurses indicated their hospital did not provide

safe work environment for staffs and patients. Nurses noted that the inadequate design, allocation, and direction of their unit created underline risks for patients or nurses. Nurses described: ″the distance between two beds is too close…easily increase the probability of cross-infection”; ″beds are not truly sterilized”; ″the assigned patients included patients with poor immunity and patients with infection, occasionally it will cause the cross-transmission”; ″The unit should not be too long. It is not convenient for CPR”

> ″There is unsafe design in nursing work environment. The space is too crowd between wards… After the equipment are placed in the room, it often causes nurses to bump into the equipment and get bruise while caring for patients. But colleagues always treat it as irrelevant small injury, and ignore it…this might happened to patients. Hope our hospital can redesign and improve the circulation within a ward, the space and the lighting equipment. ″

Unsupportive manager. Some nurses complained that their head nurse or the higher-level nursing administrator was unable to show empathy, support or caring to staff nurses. Nurses had limited opportunity to express their thoughts. Nurse commented: ″The manager only knows to make good paper work without taking care of staff member’s feeling and problems″; ″Nursing Department can only announce the policies without carefully evaluating the lower-level staff’s working ability…they should come and actually try to do it″; ″sometimes raise questions, the leadership will suppress it, thus leading to the old problems to be unresolved, then new problems derived from it″; ″if Dr has opinions on nurses, hope HN can clarify the issue with the relevant person, do not always be with doctor’s standpoint. Please care more about the poor nurses″.

Poor nurse-physician relationship. Some nurses complained that the nurse-physician relationship was poor. Nurses noted that the status between nurses and physicians was unequal. Nurses were not trusted, valued, respected or recognized by physicians. Nurse's opinions were often ignored by physicians. The poor nurse-physician relationship sometimes even led to poor nurse-patent relationship. Nurses commented:

> ″Doctors is the biggest one. Nurses still can not fully become independent professionals…male physicians view the female as the weak one, take the premise that respect is unnecessary while communicating with nurses and taking care of patients. ″
>
> ″[Doctors] do not just believe yourselves, please listen to nurse's judgment. Encourage nurse if it's correct, teach nurses if it's wrong. Should not always be mean to nurses and tell us to re-check it. At least, we are the one who spend the longest time with patients. You, doctors, were not there, weren't you? ″
>
> ″Attending physicians are too arrogant, always disregard of the idea of nurses…Some attending physician should get more education, should seek more benefit for patients rather than just want to make the money. ″
>
> ″Physician is still at higher status…Whenever physician releases the order, nurses must get it done immediately. If the nurse has different opinions, physicians will often ignored them. ″
>
> ″Physicians always let nurse to take the blame for their mistakes, or deny nurses while interpreting patient's condition to their family members, make nurses be suppressed, then make patients and their families not to trust nurses. ″

Poor peer supports. Some nurses indicated that the relationship among nurses was poor. Nurses commented: ″ colleagues on the unit are often easy to engage in small groups″; ″senior nurses can't accept changes like adding some flexibility in nursing

profession or in the interaction with patients″; ″[nurses] sometimes focus on hierarchical system too much, make it unable to hold equal views to discuss the matters″; and ″very disappointed with how colleagues get along″. Nurses also indicated that they were unable to get adequate support from peers because they worked with incompetent staff. Nurses commented: ″there is a hug gap between the new nurses and experienced nurses. Have to take care of patients and the new staff″; and ″the quality of new nurses is worse than before, have to spend more efforts in guiding them″.

Nursing profession being devalued. Some nurses commented that nurses were devalued and not respected or fair treated in the current practice environment. They complained that nurses were treated as ″advanced maids″ and were often ″not respected″. As compared with other health professionals, nurses sated that they were ″in low status″ and their hospital ″treat nurses different from doctors″. Nurses commented:

> ″Nurses can not get the necessary respect. Nurses are always in the lowest level in hospitals, can not get reasonable pay and benefits (e.g. free accommodation for doctors, not for nurses etc)…Facing a dispute, no matter right or wrong, [nurses] always yield first. ″

> ″While dealing with doctor's problems (unreasonable), Hospital always take the attitude, 'let it be', nurses have to be wronged. ″

Limited nursing autonomy. Some nurses also noted that they had low professional autonomy in current practice environment. Nurses stated that they were unable to independently make a decision and freely act for it on their work unit. Several nurses sated that they had to ″work by doctor's orders″. Nurses viewed themselves as

″physician's assistant″. One nurse said, ″although nurses have opinions, the decision is still made by the attending physicians″. Nurses were unsupported to be independent so they tended not to express personal thoughts. One nurse complained, ″too standardized, always could only work by orders, [nurses] still can not have the right for autonomy, nurses need to insist for their own profession″. Nurses wished they could have more autonomy in clinical practice.

> ″Nursing should have more independence, autonomy, do not only rely on doctor's order, [nurses] actively contact other health care teams, together discuss and to meet the needs of the case. ″

*Poor Nurses Satisfaction and Retention. T*he environment of care created negative impact on nurses' quality of life. Several of nurses stated that their level of joy, overall sense of well-being or pleasure in daily activities decreased. Nurses often sated that they had ″no quality of life″. Nurses complained that they had to spend most of their time in work without adequate rest. Even nurses were on days off they were often required to attend work related activities. Many nurses dissatisfied with their quality of life. Nurses sated:

> ″Often have to use personal days off to join in hospital's activities and courses. There is compulsory public service activities such as community screening. After completing these activities, need to continue to work, so that we can not have the full rest. Feel very fatigued in the work. ″

> ″Except for work, [nurses] also need to take some classes from nursing association or the hospital, and write papers…vacation time is little…feel unable to get enough rest while taking a day off. ″

Commenters indicated that a flexible work schedule was not available for nurses. Because nurses had to work in different shifts, they lived in an irregular life without adequate rest and had little time with families. Nurses said,

> ″Have no really enough time to rest (chaotic scheduling), work schedule can not be fixed in the day shift. That makes nurse who has a family [get married] fatigued. ″

> ″Sometimes work more than 40 hours per week. Sometime feel that have taken more than you can handle…plus the three-shift system, can not handle both of home and work, feel very tired. ″

Nurses' wellness was threatened by the unsupportive practice environment. However, nurses indicated that their hospital did not take nurses' quality of life into account. A nurse said,

> ″[Hospitals] oppress nurse's body and mind without taking care about that only the nurse with sound body and mind can demonstrate profession…It's impossible to even take a rest or be relaxed. Work becomes a routine, only can repeat the work. ″

Sever of nurses in this study mentioned that the turnover rate of nurses increased in their hospital because of the poor practice environment. One nurse stated,

> ″Salary is little, manpower is little, take care of many patients. No wonder that no one wants to become a nurse now…After being guided for few months, [New nurse] quit the job. There are many students studying in nursing school, but only few of them join the work. ″

Some commenters pointed out that high turnover rate had hindered the transfer of nursing profession. They stated, ″the turnover rate is too high, the profession can not be

transferred″; and ″the high turnover rate results in that there is no enough consistency and profession in guiding new nurse. ″

Several of nurses complained that they often had to struggle in maintaining quality of care under the constrained manpower condition. A nurse described,

> ″The manpower is insufficient but there is more and more requirements for quality of care. It's too difficult! If [nurses] can not work well or did not work, there is a punishment. There is no reward for the good performance. ″

Nurses indicated that they were suffering in the unsupportive practice environment. One nurse stated,

> ″I feel that nursing in Taiwan is a discipline that is not valued, because even if [nurse] got sick or do not feel good, [nurse]can not take an off the duty due to the insufficient manpower, unless it's very serious. [nurse]having Menses still needs to bear the pain to work. When [nurse] get off the night duty to go home, still need to worry about if will encounter bad guys or not. Hospital completely does not care. It's very clear that the manpower is insufficient, one nurse takes care of 8-9 patients at day shift, 10-15 patients at evening shift, 20-23 patients at night shift (while beds were fully occupied). [nurse] Need to take an off immediately only because of a word from the leaders. [nurse] must handle too many chores, such as: restaurants, bathroom, toilets, lamps, care, care assistants, noise from next ward…, it's definitely weird to get a good quality of nursing care like this. When [nurse] delay to get off the duty, [nurse] can not get any bonus for the overtime work, unless patients got CPR. Otherwise, you just can only blame yourself that you work too slowly. ″

Summary

This chapter reported four psychometric evaluation results to answer Research Questions 1 and 2. Multiple liner regression was used to answer Research Question 3. Data from the open-ended question was used for content analysis on comments of nurses. Survey data from 977 valid cases that were Taiwanese nurses working in acute care settings were used for the relevant analyses.

By using 38 PPE items for PCA with Varimax rotation, forcing the items into eight factors and assigning the items into the components that underpinned the original PPE Scale, the results showed that the 38-item ACPPE could not demonstrate conceptual equivalence in Taiwan as relative to the English version of the PPE Scale. However, by using 36 of the 38 PPE items for PCA with Varimax rotation, the 36-item ACPPE underpinned by eight components was produced and demonstrated acceptable internal consistency, test-retest reliability, construct validity, and concurrent validity. Twenty-eight new items were added into the original PPE Scale based on results of content validation constructed in Taiwan. PCA with Varimax rotation for 38 PPE items along with the 28 new added was performed. The results showed that by using 64 of the 66 items, the 64-item ACPPE underpinning by 12 components was produced and demonstrate an acceptable construct validity and internal consistency. In order to facilitate the utility of the PPE Scale in different cultures as well as increase opportunities for cross-cultural comparison, the researcher further refined the 64-item ACPPE into a 58-item scale, which included 35 original PPE items and 23 new added items. PCA with Varimax rotation with

the 58 items was performed to pursue a refined scale with the constructs that were common across culture and specific to Taiwanese culture to best measure the professional practice environment for nurses. The results showed that the 58-item ACPPE was underpinned by 11 components and demonstrated acceptable internal consistency, test-retest reliability, construct validity, and concurrent validity.

The results of multiple liner regression showed that the 12 demographic variables including age, months of being a nurse, months of working on the unit, and months of working in the hospital, martial status, educational degree, work position, studying for a degree, rank, work unit, salary as a major source of family income, and monthly salary together accounted for 1.4% of the variance of the total score of the 58-item translated-adapted Chinese version of the PPE Scale. The educational degree was the only demographic variable that was significantly correlated with the total score of the 58-item translated-adapted Chinese version of the PPE Scale ($p < .05$). The results indicated that participants who owned BSN or higher degree were more likely to repost higher total score on the 58-item translated-adapted Chinese version of the PPE Scale.

Through analyzing nurses' comments, two major themes emerged from the content analysis. The data indicated that the environment of care was compromised by: (1) poor nurse staffing, (2) work overload, (3) too many non-nursing tasks, (4) inadequate resources for patient care, and (5) de-specialized unit. The patient quality of care decreased within the compromised environment of care. Working in the environment of care, many nurses perceived that they were not supported because of :(1) demanding

working conditions, (2) poor welfare and salary, (3) inadequate resources for professional development, (4) unsafe work environment, (5) unsupportive managers, (6) poor nurse-physician relationship, (7) poor peer supports (8) nursing profession being devalued, and (9) limited nursing autonomy. The unsupportive environment of care led to dissatisfaction with quality of life and high turnover rate of staff nurses.

CHAPTER VI

DISCUSSION, IMPLICATIONS, RECOMMENDATIONS, AND CONCLUSION

Introduction

The purpose of this descriptive, cross-sectional, methodological study was to develop and evaluate the psychometric properties of the Chinese version of the PPE Scale. This study was constructed based on translation theory (Brislin, 1970), measurement theory (Waltz, Strickland, Lenz, 1991), and psychometric theory (Nunnally & Bernstein, 1994) and was accomplished in two major phases. In Phase I, the original English version of the PPE Scale was translated into Chinese through a set of thorough procedures and its contents were validated and culturally adapted as needed to fit in Taiwanese culture for measuring the professional practice environment for nurses. In Phase II, the survey data generated from a valid sample of 977 staff nurses working in 4 acute care hospitals in Taiwan were subjected to analysis to evaluate the psychometric properties of the translated-adapted Chinese version of the PPE Scale. This chapter presents the discussion of the research findings. The conclusion drawn from the results of the data analysis is presented. Implications of this study in nursing education, practice and research are addressed. Recommendations for further studies are offered.

Discussion of the Research Findings

The findings obtained in the two phases of this study are discussed separately. The findings from Phase I focused on the challenges in the development of the Chinese version of the PPE Scale and the semantic and content equivalence between the

translated-adapted Chinese version of the PPE Scale and the original English version of the PPE Scale. The findings from Phase II, the conceptual equivalence between the translated-adapted Chinese version of the PPE Scale and the original English version of the PPE Scale, the psychometric properties of the translated-adapted Chinese version of the PPE Scale, and the degree to which the selected demographics explained Taiwanese nurses' perceptions of their professional practice environment are discussed.

Discussion of the Research Findings in Phase I

Challenges in the Development of the Translated-Adapted Chinese Version of the PPE Scale

To ensure the quality of translating the English version of the PPE Scale into Chinese, this study applied a set of thorough techniques which were synthesize from several cross-cultural research (Banville, Desrosiers, & Genet-Volet, 2000; Beck, Bernal, & Froman, 2003; Brislin, 1970; Dela Cruz et al, 200; Drasgow, & Hulin, 1987; Geisinger, 1994; Guillemin, et al., 1993; Kristjansson, et al, 2003, Marine & Marine, 1991; Tang & Dixon, 2002). The multiple techniques utilized in this study to accurately translate the PPE Scale into Chinese included forward and back translation, multiple translators, panel discussion, bilingual and monolingual experts' evaluations, pre-testing with target monolinguals, testing translation equivalence with bilinguals and monolinguals. Although use of multi-methods and multi-round translation processes did cost tremendous time and effort, these multiple techniques were useful in facilitating a quality Chinese translation of the PPE Scale.

In the development of the Chinese version of the PPE Scale, there were several challenges. The first was how to recruit the qualified translators and bilingual reviewers and maintain their commitment to this project was one of the challenges. The difference of language meaning and structural between the Chinese language and the English also led to challenges in translation.

Simply translating an instrument into a different language without concern for its usability and meaning in another culture can mislead the cross-cultural research (Yu, Lee, & Woo, 2004). In order to augment the usability of the PPE Scale in Taiwan, some wordings of the PPE Scale were adapted. While translating the PPE Scale from English into Chinese, the dilemma in translating the subject of the test items ″staff ″into Chinese was noted. According to the concept and definition of the different test items, ″ staff ″was literally translated into Chinese as ″工作人員″ or ″護理人員″. For example, one of the translators translated the term ″staff ″ on Item 22 (Staff withdraw from conflict) as ″工作人員″ but as ″護理人員″ on Item 4 (A lot of teamwork between physicians and staff). In contrast to ″護理人員″, ″工作人員″ could broadly refer to all the clinicians and not just nursing. The original PPE Scale was developed for use by multiple disciplines including nursing, occupational therapy, physical therapy, respiratory therapy, social services, speech pathology, and the chaplaincy. Therefore, ″工作人員″ seemed to be comparable to ″staff″ in the PPE Scale. However, this study assumed that nurses were the only population for the survey in this study, so ″護理人員″ could also be appropriate to capture the meaning of the object of the test items on the Chinese PPE Scale.

Kristjansson and colleagues (2003) suggested that discussions with a third expert or with the translators could resolve the differences of the translations. The preliminary discussion with two translators was unable to resolve the differences. With concern about the different literal meaning of the Chinese translations for ″staff”, one of the developers for PPE Scale was consulted. Finally, based on the research design of this study, the subject of the test items ″staff″ was decided to be changed as ″staff nurses″ to prevent ambiguities and be translated as ″護理人員″.

Another difficulty in translation was that the interpretation of wordings could be cross-culturally different. In this study, both of the two translators all translated ″manager″ into Chinese as ″管理者”. The term ″manager″ on Item 9 (A manager who is a good manager and leader) and on Item 12 (Manager who backs up staff in decision making, even in conflict with MD) clearly referred to an official tile of a nursing administrator at the study hospital where the PPE Scale was developed. However, according to the literal meaning, ″管理者″ could possibly be interpreted by the Taiwanese nurses as the Nursing Director, Associated director, Supervisor, Head nurse, or even Leader on the unit. Similar problem was found on Item 1 (Leadership supportive to department or unit staff). The term ″leadership″ were translated into Chinese as ″領導階層″. Through pretesting result of forward translation, the reviewers asked to researcher to clearly define ″領導階層″ because this term could be interpreted as Nursing Director, Associated director, Supervisor, Head nurse, Leader on the unit or any of administrators in the center of the hospital. The various interpretations to the certain terms could

threaten the quality of the responses of participants. As discusses by Kristjansson and colleagues (2003), experiential equivalence should be concerned in the translation or adaptation of an instrument because the interpretation of language could be various due to different knowledge of participants. In order to prevent a bias derived from respondents' different interpretations for the term ″manager", the researcher consulted one of the developers for PPE Scale and decided to ask the two translators to replace the term ″manager″ and ″leadership″ were replaced by ″head nurse″ to narrow the possibilities of meaning to make the test item more specific.

As discussed by Brislin (1980), adding ample context for difficult term could contribute to producing a better translation. In this study, the term ″support services″ on Item 6 (adequate support services allow me to spend time with patient) was literally translated as ″支持性服務″. However, during the pretesting the draft of the Chinese PPE Scale with Taiwanese nurses, participants noted the difficulty in understanding the meaning of ″支持性服務″. After consulting one of the developers for PPE Scale, more contexts were added as exemplars of supportive services. It was found that the added contexts could help respondents easier understand the purpose of the test item.

The structure of some test items, without a clear subject, was found to be one of the difficulties in developing the Chinese version of the PPE Scale. As discusses by Kristjansson and colleagues (2003), pre-testing the instrument can be usefully in identifying problematic items. Though items without a clear subject were still successfully translated into Chinese, participants recruited for pre-testing the translation

contents noted that the lack of certain subject on a test item could lead to the various responses among participants. For example, one of the problematic items, Item 8, original written as ″Enough staff to provide quality patient care″ was translated in to Chinese as ″有足夠的護理人員來提供具有品質的照護″. The reviewers noted that they were not sure if questions refer to hospital, other unit or my unit when they responded to the test item. In order to reduce the bias resulted from responses to an unclear subject, the researcher again consulted one of the developers for PPE Scale and adapted the problematic items by adding a clear subject into the statements. Finally, Item 8 was revised as ″ This unit has enough staff to provide quality patient care″ to guide participants to clearly use their work unit for judgment.

Selecting the best translation for wordings with multiple meanings in another culture was another challenge in developing the Chinese version of the PPE Scale. Item 34 (I am motivated to do well because I am empowered by my work environment) was found to be the one that was hardest to be translated into Chinese. The problem on Item 34 mainly came from the multiple meanings of the term ″empower″. According to the explanations from dictionaries, the verb word, ″empower″, indicates two meanings including: (a) authorize; give authority or official power to and (b) enable; give strength and confidence to; give moral, physical power, abilities to. Many different Chinese literal translations for the term ″empower″ were used in Taiwan such as ″授權″, ″增權″, ″使能夠″, ″允許″, ″授能″, ″灌能″, ″賦能″, ″充能″, ″授權增能″, ″彰權益能″, ″增權益能″, ″增權廣能″, ″賦權增能″ and so on. These possible Chinese literal translations for ″empower″ focus on

giving ″power″ (權力) to someone to motivate the person to perform best personal competence and in the long run increasing the person's ″ability″ (能力). Item 34 was originally developed within the concept of Internal Work Motivation, defined as self-generated encouragement completely independent of external factors such as pay, supervision and co-workers. Those possible Chinese translations with a focus on giving ″power″(權力) did not fit in the concept of Internal Work Motivation because the translations involved an external factor, ″power″ (權力). The wordings of ″灌能″, ″充能″, ″益能″, or ″增能″ were related to enabling or give strength or ability to someone and were often used in professional disciplines rather in part of everyday-spoken languages. Two bilingual reviewers who were outside nursing discipline indicated that those possible Chinese literal translations for ″empower″ were often used in professional disciplines such as management, education or nursing fields. The bilingual reviewers pointed out that using the 'academic' wordings might confuse the participants because the wording was not part of daily language used for most of the nurses. In order to purse the best translation for Item34, a field test of the possible translations for Item 34 was performed with five Taiwanese nurses. Some of the nurses did described they had to try to guess the potential meaning behinds the possible Chinese literal translations for ″empower″. An American living and teaching English in Taiwan over 10 years was also consulted for pursuing best translation for the Item 34. The American teacher suggested using Chinese wordings with the meaning similar to ″inspire″ to translate ″empower″. The specialized vocabulary used in the study challenged fluent bilinguals. Sharing the researchers'

perspective and knowledge about the study issue with translators facilitated the comparability of the translated instrument to the original instrument helped make the question more comprehensible to the respondents (McKay et al., 1996). The results of the field test were discussed with one of the developers for the PPE Scale to help judge the translation and further understand the meanings within the Item 34. The above information was passed to translators and bilingual reviewers for further discussions and judgment. Finally, a consensus on using ″inspire″ as the synonym of ″empower″ for translation was obtained through the several runs of committee discussion. The term ″empower″ on Item 34 was translated into Chinese as ″激勵″.

Semantic Equivalence of the Chinese Version of the PPE Scale

Using multiple techniques to establish equivalence between different languages was often suggested in cross-cultural research (Brislin, 1980; Geisinger, 1994; Guillemin, et al., 1993; Maneesriwongul & Dixon, 2004). In order to ensure the semantic equivalence of the 38 translated-adapted Chinese items as relative to the English version of the PPE Scale, this study carefully recruited qualified translators and applied multiple methods including conducting translation committee, monolingual/bilingual experts review, and monolingual lay target population review during the translation process and empirically testing the equivalence between the versions with monolingual/bilingual nurses after translation process. In general, the evaluations of semantic equivalence of the translated-adapted Chinese version of the PPE Scale in this study were carefully secured by two methods, which were judgmental methods and empirical testing methods. As

discussed by Chang and colleagues (1999), it was inadequate to use bilingual subjects alone to assess the equivalence of a translation tool evaluate. Within each of the two evaluation methods, this study specially combined monolingual and bilingual subjects to assess the equivalence of versions. Although some items were adapted for cross-cultural use, the evaluations of semantic equivalence during translation process and after translation process showed that the 38 items on the translated-adapted Chinese version of the PPE Scale had satisfactory semantic equivalent as relative to the original English PPE Scale.

This study also revealed some important issues regard to evaluating the semantic equivalence between different languages. It was often assumed that bilingual/monolingual subjects' responses to the translated questionnaire could be used to assess the equivalence between the source language and target language. This study found that the judgmental methods, which mainly focused on asking the monolingual/bilingual experts to use a Likert scale to rating the equivalence between versions, were easy and useful to assess the semantic equivalence. However, the empirical testing methods, which focused on using the monolingual/bilingual nurses' responses to the questionnaires, were found to be somehow troublesome. During collect data from empirical testing processes, bilingual subjects were asked to separately fill out the two surveys with different languages in the same time. Some bilingual participant indicated that they were unable to give responses to the test item because they recalled different image in responding to the test items. For example, a bilingual nurse said that

she rated ″agree″ for Item 13 (Physicians and nurses have good working relationship) on the English questionnaire and rated ″disagree″ for Item 13 (醫生和本單位護理人員之間有良好工作關係) on the Chinese questionnaire, because different image of the ″physician″ popped out in their mind during responding to Item 13. The bilingual nurses indicated that she was aware of her different responses to the same item when she filled out the second questionnaire. She just honestly reported her perception at the two different timings. In order to detect whether the various responses came from poor translation or the fluctuation of respondent's perceptions in different timings, the researcher further invited a bilingual physician to simultaneously fill out the two language versions of the test item. The fact that a respondent could use different ″target image″ to respond to a same test item at different timing was revealed. The fact was also noted in testing the two versions with monolingual nurses in a 7-day interval in this study. A monolingual nurse invited by the researcher for pre-testing the questionnaires pointed out that the practice environment was so changeable that she always had different perceptions to the environment. Form this information, the poor consistency of the versions showed in Table 14 and Table 13 might be explained by the fluctuation of personal perceptions rather than the problem in translation.

Although using bilingual subjects to establish equivalence between different languages was encouraged for cross-cultural research (Chang et al, 1999; Maneesriwongul & Dixon, 2004; Sireci, & Berberoglu, 2000; Geisinger, 1994; Guillemin, et al., 1993), this study found that using monolingual/bilingual subjects in empirical

testing method alone without judgmental methods might mislead the evaluation of equivalence. Especially for a study with focus on exploring participants' perceptions which often change in different timings, using bilingual subjects in empirical testing should be carefully concerned. For translating a questionnaire, which is related to human perceptional issues, into a different language for cross-cultural research, this study suggested that using monolingual/bilingual in empirical testing for evaluating semantic equivalence could be omitted. Otherwise, the use of monolingual/bilingual in empirical testing should simply focus on asking the participants to judge the consistency between versions instead of asking participants to respond to the questionnaires.

The language ability of the bilingual nurses was another issue concerned in this study. Because of research limitation, this study assumed that a nurse with at least Bachelor degree would be qualified for being a bilingual subject because university students are often required to study English textbooks. Using education level instead of conducting any examination to objectively screen the English ability of a subject to sample the bilingual subjects for empirical testing could be a weakness of this study. This may cause bias in empirically testing with bilingual subjects. On n an item-by-item analysis base, items unable to achieve the consistency between the versions of the PPE Scale could be explained by the inadequate competence in English of the bilingual subjects.

Another measurement issue related to the evaluation of semantic equivalence was noted in this study. Through review literatures related to translating a questionnaire into

another language for cross-cultural use, the researcher found that there was no census on the unit of analysis. The analyses for evaluating the semantic equivalence between the different versions varied from a single item, subscale, to total scale. For example, Mallinckrodt and Wang (2004) reported the subscales score between different language versions. Sousa, Zauszniewski, Mendes, and Zanetti (2005) reported the scores of all the items between different language versions.

In order to evaluate the quality of the translated instrument, each item's translation should be carefully reviewed. If the semantic equivalence of each of the items between different versions were not examined and reported, the quality of the translated instrument would be hard to be judged by readers. Hence, this study compared each of the items on the source language version with its comparable item on the target language version for the evaluation of the semantic equivalence. The results revealed that using subscale or total scale as unit of analysis could create the risk of over-estimating the translation quality. Analyzing the semantic equivalence of every item could allow the researcher to better judge the translation quality. Though the control type I error was another issue needed to be concerned while performing multiple comparisons for analyzing every item's semantic equivalence, the Bonferroni correction method could be used to overcome this problem.

Content Equivalence of the Chinese Version of the PPE Scale

An instrument with satisfactory semantic equivalence could be obtained through quality translation. However, quality translation could not guarantee the content of each

item of the instrument could be used in different culture (Kristjansson, et al, 2003). For cross-cultural research, it's important to establish content equivalence by assess whether the contents of each item of the instrument is relevant to phenomena of the studied culture (Flaherty et al, 1988). Hence, after the semantic equivalence was established, this study further evaluate the content equivalence of the translated-adapted Chinese version of the PPE scale by recruiting two group of Taiwanese nursing experts to evaluate the contents of each item of the instrument. In addition to the evaluation of relevance, which was assumed to be used for assessing content evaluation (Flaherty et al, 1988), this study further asked the Taiwanese experts to review the representativeness, clarity, and readability of each of the items and the comprehensiveness of the items and concepts recruited on the scale to determine the possibility of using the 38 PPE items in Taiwan for cross-cultural research. The CVIs of relevance, representativeness, clarity, and readability for each of the 38 translated-adapted Chinese PPE items were greater than .80. The satisfactory content validity indices supported the content equivalence of the 38-item Chinese PPE scale and its usability in Taiwan.

However, the evaluation of the comprehensiveness showed that more items might need to be added in the existing 38 items to better measure nurses' practice environment in Taiwan. As a result, 27 items were suggested being added by Taiwanese experts. Of the 27 added items, seven items were added to measure a new concept, nursing professional development, and 20 items were added into some of the existing domains. The necessity of adding items may be explained by that the original PPE Scale has a weakness in

detecting the emic ideas and concepts in a different culture. The cultural-specific ideas or concepts could better be measured by adding more culture-sensitive items into an existing scale.

Discussion of the Research Findings in Phase II

Conceptual Equivalence of the Chinese Version of the PPE Scale

Psychometric properties of the 38 translated-adapted Chinese PPE items. The original English version of the PPE Scale consisted of 38 items. The 38 items were translated into Chinese and adapted to reflect the meaning of the terms within Chinese culture based on respondents opinions. For the purpose of evaluating the concept equivalence of the Chinese version of the PPE Scale, the survey data of the original 38 PPE items were separately subjected to be analyzed. In this study, concept equivalence was secured by comparing the factor structures between the original PPE Scale and the 38 translated-adapted Chinese PPE items by using PCA with varimax rotation, which was utilized in the study of the psychometric evaluation of the original English PPE Scale.

This study initially assumed that the 38 translated-adapted Chinese PPE items could demonstrate a factor structure similar to the original English version of the PPE Scale. Because the original English PPE Scale was constructed by eight components, this study performed PCA with Varimax rotation along with forcing the number of factors into eight components and assigning the 38 items to the factors to which the item originally belonged in the English PPE Scale. The results showed that though the item groupings of the factors in the 38 translated-adapted Chinese PPE items were similar to those of the

English PPE Scale, seven of the eight extracted factors had problematic items with factor loading less than .30. There were only four of the eight components had a Cronbach's alpha coefficient greater than .70, although the Cronbach's alpha coefficient for total 38 PPE items was .91, There was only one component which was composite of items with factor loading greater than .30 and had a Cronbach's alpha coefficient greater than .70. This factor was named as Internal Work Motivation, which was as the same as the English version. The results indicated that the 38 translated-adapted Chinese PPE items could demonstrate a conceptual equivalence as relative to the original English version of the PPE Scale.

Psychometric Properties of the Chinese Version of the PPE Scale Demonstrated in Taiwanese Acute Care Settings

Psychometric properties of the36-item Chinese PPE items. In order to validate the psychometric properties of the 38 translated-adapted Chinese PPE items, this study performed another PCA with Varimax rotation without forcing the number of factors into 8 components or assigning the 38 items to the factors to which the item originally belonged in the English PPE Scale. According to the six criteria developed in this study for assigning items onto the relevant factors, two items (Item 13, 36) were eliminated due to conceptual incongruence. The remaining 36 items were subjected to PCA with Varimax rotation and yielded an 8-component solution. The 36 translated-adapted Chinese PPE items also demonstrated satisfactory reliability by showing that total scale had Cronbach's alpha coefficient of .90; and seven of the eight components had a

Cronbach's alpha coefficient greater than .70, except one component with a borderline Cronbach's alpha coefficient of .68. The component with a weakness in internal consistency was composit of two items originally belonged to Cultural Sensitivity in the English PPE Scale. The 36-item Chinese PPE Scale composited of 8-component also demonstrated satisfactory test-retest reliability and concurrent validity in a sample of Taiwanese nurses working in acute care settings.

Although the item groupings of the factors in the 38 translated-adapted Chinese PPE items was not totally congruent with those of the English PPE Scale, the comparison of the 36 items on eight factors between the Chinese and English versions of the PPE scale showed that approximated 27 of 36 items in the Chinese PPE Scale were loaded onto seven factors to which the items originally belonged in the English version. The results also indicated that the meaaning of factors in the 36 PPE items altered across cultures, though factor structure was somehow similar to the original English PPE Scale. For example, the eight items originally sued for measuring the domain of Handling Disagreement and Conflict grouped with other items and tended to be measure two domains, Handling Conflict and Interpersonal Interaction

This study revealed that translating and adapting an instrument into a different language for cross-cultural use could possibly yield an instrument that had psychometric properties different from the original instrument. This finding was similar to some cross-cultural research results. For example, Kobayashi (2006) translated the NWI-R into Japanese and the evaluation of its psychometric properties showed that Japanese nurses'

responses yielded a different factor-structure with items classification different from the original NWI-R. Estabrooks and colleagues (2002) applied the NWI-R in Canada to measure the hospital practice environment. The results showed that the even using the English NWI-R in a different culture where people also speak English, the NWI-R demonstrated a different factor-structure with different items classification in the different culture. This finding echoed the importance of evaluate and establish the psychometric properties of the tool before it is applied in clinical settings. This information also raised the concern about the importance of conceptual equivalence in cross-cultural research. Van de Vijver and Poortinga (1997) noted that it was inappropriate to simply assume the instrument had same psychometric properties without empirically testing its psychometric properties in a new culture, while using an instrument originally developed in different culture/language. Before using a test which was translated from a different language, the reliability and validity of the test should be established (Geisinger, 1994).

The different factor-structure and item classification noted in this study may potentially be explained by the cultural difference on interpreting some underlying meaning conveyed with the items or different study samples between the two versions, and the cultural adaptation of the instrument. The original PPE Scale was developed based on the Professional Practice Model developed by the administrative leadership at MGH, U. S. A., to measure the practice environment of clinicians from multiple disciplines. The psychometric properties of the original English PPE Scale were validated by multiple clinicians, whereas the psychometric properties of the Chinese PPE Scale

were validated only by Taiwanese nurses. Because the original PPE Scale was developed based on Magnet hospital concepts, the PPE Scale could be used to measure important essentials of a magnet hospital. However, it was unknown whether the attributes of a professional practice environment in the United States would be valued by Taiwanese nurses. Also, it was unsure where or not the selected study hospitals hold the attributes of a professional practice environment recognized in the United States. Moreover, the wordings of some items on the original PPE Scale were culturally adapted when the scale was translated into Chinese. These differences offer the credibility to the explanation.

Psychometric properties of the 64-item Chinese PPE items. As mentioned earlier, 66 items including 38 translated-adapted Chinese PPE items and 28 added items were used to collect data for psychometric evaluations. Because most of the added items were created under the existing domains of the PPE Scale and only seven added items were used to measure a new concept, this study primarily assumed that the 66 items could demonstrate a 9-factor structure similar to the original English version of the PPE Scale. However, PCA with Varimax rotation along with forcing the number of factors into eight components could not produce a satisfactory solution. After several runs of PCA with Varimax rotation, the results indicated that after the deletion of two concept-incongruent items (Item 36, 54) a 12-factor solution was the most interpretable for the 64 items. The comparison of the factor structures between the original PPE Scale and the 64 translated-adapted Chinese PPE items showed that adding items into existing items could affect the validity of the measure for the intended use. Adding items into the original 38

PPE items led to that the dimensions of the 64-item Chinese PPE Scale somewhat differed from those in the original PPE Scale, although some dimensions were found across culture. For example, the original English PPE Scale was developed to measure 8 dimensions. After items added, the 64-item Chinese PPE Scale was expanded to measure 12 dimensions. Of the 12 dimensions in the 64-item Chinese PPE Scale, seven dimensions were noted to be somewhat similar to the original PPE Scale. Except to Internal Work Motivation with item groupings same as original PPE Scale, the groupings of items on factors differed across culture. For example, the Control Over Practice were clustered with 7 items (Item 5, 6, 7, 8, 10, 11, and 14) in the original PPE Scale but it were clustered with 5 items (Item 6, 7, 8, 10, and 11) in the 64-item Chinese PPE Scale.

Another interesting finding from the psychometric evaluations of the 66 items was noted. Although 21 of the 28 added items were initially created under the existing domains of the PPE Scale to increase the comprehensiveness and seven of the added items were created to measure a new concept, the results showed that 18 of the 28 added items did not load into the factors as expected. Only 6 of the seven items which were expected to measure a new concept and 4 of the 21 items which were expected to measure existing domains of the PPE Scale did group together as expected. In other words, the added items viewed by experts as relevant to the measured domains could possibly be used to measure another context beyond the original domain. The unexpected item groupings may be explained by the differences in perception and interpretation about the wording of the test items among individuals. However, the change of

psychometric properties resulted from adding items into an instrument raised an important issue for future cross-cultural research. When translating an instrument into different language with adapting the instrument for cultural use, it is inadequate to simply assume the instrument had psychometric properties same as the original instrument in a new culture, even the instrument with satisfactory content validity had already been empirically validated by experts in the studied culture.

Psychometric properties of the 58-item Chinese PPE scale. It was common that a researcher would translate/adapt an instrument from different language just for the purpose of utilizing the tool for measuring certain contexts within the studied culture rather than for cross-cultural comparison. Adding items into an instrument could help an instrument to be used in different culture but also resulted in the difficult in cross-cultural comparison (Brislin, 1970). This study revealed that added items into an existing instrument might be able to contribute some new important concepts into the original instrument. Adding items to increase the usability of the translated/adapt instrument in a different culture could be a shortcut to develop a culture-sensitive instrument. In order to facilitate the utility of PPE Scale in Taiwan as well as its application to cross-cultural comparison, this study further used 64-item scale as prototype for refinement. After six items were deleted, the remaining 58 items including 35 original PPE items and 23 new added items were subjected to another PCA with Varimax rotation. Three explanations for the elimination of the six items were offered. First, high inter-item correlation ($r \geq .80$) between items shows a potential problem of multicolinearty within the scale, which

means two items might be overlapping and redundant (Pett, et al., 2004). Because of the borderline high inter-item correlation (r = .79) between Item 53 and Item 52, Item 52 was deleted. Second, PCA with Variamx rotation showed these items grouped together with satisfactory factor loadings. However, the concept of the five items seemed to be incongruent. For example, of the excluded five items (Item 37, 38, 39, 40, 57), Item 37 and 38 were original PPE items and Item 39, 40 and 57 were new added items. Originally, Item 37, 38, and 57 were used to measure cultural sensitivity; Item 39 was created to measure control over practice; and Item 40 was created to measure autonomy in clinical practice. Third, the cultural difference in interpreting the items among individuals could compromise the usability of the items in both cultures. For example, according to the face literal meanings of the items, Item 37 (Staff nurses in this unit are sensitive to the diverse patients population whom they serve) would be thought to be relevant how well the nurses know the patients if the reader pay attention to the phrase ″be sensitive to”. Item 38 (Staff nurses respect their unit’s diverse health care teams) would be thought to be relevant to the interaction between coworkers, if the reader pay attention to the verb ″respect”. However, Item 37 and 38 could also be though to be relevant to cultural sensitivity because the term ″diverse″was stressed in both of the items. Interestingly, after items were added, PCA with Variamx rotation showed the five items grouped together and could be used to explain another context, Nursing Care, which referred the degree to which staff nurses manifest professional nursing to provide quality patient care. In sum, the potential problem of multicolinearty in items, the conceptual incongruence among

items and the potential cultural difference in interpreting items among individuals supported the elimination of the six items.

The remaining 58 items were subjected to PCA with Varimax rotation and yielded an 11-component solution which was totally congruent with 11 of the 12 factors in the 64 translated-adapted Chinese PPE items. The 58 translated-adapted Chinese PPE items demonstrated satisfactory internal consistency by showing that total scale had Cronbach's alpha coefficient of .95 and all the 11 components had a Cronbach's alpha coefficient greater than .70. The 58-item Chinese PPE Scale composited of 11-component also demonstrated satisfactory test-retest reliability and concurrent validity in a sample of Taiwanese nurses working in acute care settings. The analyzed 58 items were composite of 35 original PPE items and 23 new added items. Of the 23 new added items, 16 items were initially created under the existing domains of the PPE Scale to increase the comprehensiveness and seven of the added items were created to measure a new concept. However, the psychometric evaluations indicated that only 6 of the 7 items which were initially expected to measure a new concept and 4 of the 16 items which were originally expected to measure some certain existing domains of the PPE Scale did group together as expected. In other words, 13 of the 23 added items did not load onto factors as expected. Of the 35 original PPE items, 10 item groupings changed. The results again supported the importance of establishing the psychometric properties of an instrument which was translated/adapted from another language/culture before the translated/adapted instrument was used. The psychometric properties of an instrument could be altered by

translating/adapting the instrument into a different language/cultural or adding items into it.

Of the 11 factors underpinning the 58-item Chinese PPE scale, 8 factors were mainly constructed by 35 original PPE items and 3 factors were mainly constructed by the added items. Though the factor structure of the 58-item Chinese PPE scale was somewhat different form the 38-item English PPE Scale, in general, the 58-item Chinese PPE could be able to capture seven of the eight domains that the original English PPE Scale intended to measure and three new domains that the original English PPE Scale unable to measure. Although adding items into existing items might affect the validity of the measure for the intended use, this study revealed that it could be helpful to strengthen the original instrument. For example, organization's support for professional development and the availability of adequate resources of nurses were viewed as important factors that a hospital could retain and attract professional nurses (AACN, 2002; McClure & Hinshaw, 2002) but most of the instruments for measuring nursing practice environment did not cover these important domains (Lake, 2007). Through adding items in to the original PPE Scale, these two important domains could be covered by the PPE Scale in the future.

The demonstration of the adequate psychometric properties of a translated/adapted instrument is an important antecedent to its use in a new culture. The psychometric adequacy demonstrated by both of the 36-item Chinese PPE Scale and the 58-item Chinese PPE Scale supported their usability in Taiwan. The difference between

these two versions was that more items specific to nursing discipline were recruited in the 58-item Chinese PPE Scale. As mentioned before, the original English PPE Scale was designed for clinicians from multiple disciplines. Therefore, the 36-item Chinese PPE Scale which was mainly composite of 36 of the 38 original PPE items could be possible used to measure the practice environment of the multiple hospital clinicians in Taiwan, if the wordings of the subject on certain items are slightly changed from ″staff nurses″to ″I”. The 58-item Chinese PPE Scale which was composite of 35 original PPE items and 23 locally added items could be specifically applied in measure nursing practice environment because it covered the domains specific to nursing discipline such as Patient Surveillance, Support for Nursing Professional Development, and Support for Professional Practice. The 58-item Chinese PPE Scale produced in this study could be viewed as the nursing version of the PPE Scale and noted as PPE-N.

The Relationship between Demographics and Nurses' Perceptions of Practice Environment

Multiple regression analysis was performed in this study to evaluate to what extent do selected demographics explain Taiwanese nurses' perceptions of their professional practice environment. This study reveled that educational degree was the only one of the twelve demographics, which was had a significant positive relationship with the total score of the 58-item translated-adapted Chinese version of the PPE Scale. Shmalenberg and Kramer's (2008) indicated that nurses with higher education degree reported significantly higher scores with regard to essentials of hospitals such as

autonomy, control of nursing practice, nurse-physician relationship, nurses-assessed quality of care, overall job satisfaction and so on. Lee, Pain, Yen (2008) addressed that nurses with higher education degree reported higher score on satisfaction of the practice environment. The positive correlation between BSN education and lower mortality on surgical units was also noticed by Aiken, Clarke, Chueng, Sloane, and Silber (2003). This information suggested that highly emphasis on support for education is important for hospitals to create a better environment of heath care for nurses and patients.

Important factors related to Nurses' Perceptions of Practice Environment

Another regression analysis in this study also showed that a participant was more likely to report lower score on the 58-item translated-adapted Chinese version of the PPE Scale when the participant perceived that work load is heavy; he/she can not always continuously monitor and observe patients; nursing/non-nursing department does not recognize nurses' contribution to patient care. In the qualitative analyses of this study, it was also noted that nurses were unable to provide patient with adequate care, when they were assigned with heavy workload. Nurses hold negative pinions about nursing profession when they perceived there were not supported by their hospitals. From both the quantitative and qualitative results, the importance of assigning adequate workload for nurses, allowing a nurse to function as a nurse, and the support and recognition from administrative leadership in the health care environment was highlighted.

Relationship between Practice Environment and Nursing Retention and Job Satisfaction

During this process of testing the concurrent validity of the 36-item and the

58-item Chinese PPE Scale, Pearson correlations coefficients was performed to detect the relationship between the attribute of practice environment and nurses' job satisfaction and intent to leave. The results showed that subscale scores and the total- scale score were significantly and positively correlated with the scores of nurses' perceptions about satisfaction for current nursing job and satisfaction for working on the unit; and were significantly and negatively correlated with the scores of nurses' perceptions about considering working in other hospital or the scores of nurses' perceptions about considering not working as a nurse any more. One of the major themes emerging from the content analysis on nursing comments about the practice environment also showed that nurses' satisfaction and retention are compromised, when the environment of care is not supportive professional nursing practice. Reflecting some studies (Aiken, et al, 2002; Schmaleberg & Kramer, 2008; Mrayyan, 2008; Stone, et al., 2006; Upenieks, 2002), the relationship between the practice environment and nursing job satisfaction and intent to leave, which emerged in both of the quantitative and qualitative results of this study, again led to the attention to the importance of improving the practice environment for nurses.

Implications of This Study

This study developed a thorough translation and adaptation process to translate and adapt the original English version of the PPE scale into Chinese and establish the psychometric properties of the scale. The 58-item Chinese Version of the PPE scale developed in this study is a valid and reliable instrument. The results of this study could

contribute to conceptualization and measurement of nursing practice environment in nursing practice, education, and research. The methodologies utilized in this study have implications for research across cultures.

Implications for Nursing Practice

The reliable and valid 58-item Chinese Version of the PPE scale produced in this study could be reutilized in clinical nursing administration to assess nurses' practice environment and identify the problems within the environment. The better understanding nurses' practice environment could help the hospital administrators to further develop effective strategies to improve or maintain the professional practice environment of nurses to pursue quality patient care and good nursing satisfaction and retention of nurses. Furthermore, the periodic use of the 58-item Chinese Version of the PPE scale to monitor the change of nurses' practice environment could enhance the hospital administrators to continuously construct evidence-based innovation for the environment of care.

Implications for Nursing Education

Nursing professional practice environment should be an important element in the curriculum of nursing educational program. Because student nurses could be potential to play an important role of leadership in the environment of care in the future, early introducing the concept of professional practice environment to nursing students could enhance nurses' awareness of the importance of a practice environment and facilitate nurses' motivation to bring their voice when they participate in relevant policy-making activities of the hospitals in the future. The study could provide important resources

related to the concept and measurement of nursing practice environment. In particular, it becomes more and more popular for a nurse to simultaneously purse an advanced study and work in clinical settings in Taiwan. The nursing educators could better create a curriculum that links the practice and theory by introduce the concept of professional practice environment to the nurses in the advanced study program, guiding them to use the 58-item Chinese Version of the PPE scale to preliminarily evaluate their practice environment and used the evaluation data to facilitate group discussions. This study could also provide nursing educators with fruitful information when they design the curriculum of nursing research. The thorough processes for translation/adaptation and psychometric evaluations of the PPE Scale could be a valuable example to introduce concepts of translation, adaptation, and measurement to nursing students. This study could enhance students to be aware of the importance and the method of adequate translation and adaptation and establishment of psychometric properties of an instrument when a foreign instrument would be utilized in Taiwan.

Implications for Nursing Research

Improving nurses' practice environment has been a global focus. Using a valid and reliable instrument to measure the nursing practice environment could accelerate the pace of improvements. The evaluation of nursing practice environment in Taiwan is impeded by the absence of a reliable and valid instrument which is written in Chinese language and sensitive to Taiwanese culture. The implications of this study for nursing research are providing researchers with the valid and reliable 58-item Chinese Version of

the PPE Scale to assess the quality of the nursing practice environment and also creating an opportunity to link organizational structure research and patient/nurse outcomes research.

Implications for Cross-cultural Research

This study synthesized important methodologies used in cross-cultural researches and developed rigorous methodologies for translation, adaptation and psychometric evaluations. The methodologies undertaken in this study could provide researchers useful guidance in conducting cross-cultural research. For example, between the translation and back-translation processes, this study particularly arranged a group of Taiwanese nurses to first evaluate the Chinese translation before the Chinese version was back-translated into English. This special step did provided the research an opportunity to obtain a translation that could really be understood by potential participants rather than the translation that might be possible to puzzle the potential participants. The experience of pretesting the translation with potential population raised the concern about that simply translate and back-translated an instrument into different language, which was commonly used in cross-cultural study, could run the risk of obtain a translation without adequate wordings. Moreover, the utilization of judgmental and empirical testing methods in both of the monolingual and bilingual populations to evaluate semantic equivalence helped this study to ensure the quality of translation but also allowed the researcher to be aware of the appropriateness of individually using empirical testing method with monolingual and bilingual populations. The knowledge derived from the rigorous methodologies

could facilitate the methodological development in cross-cultural research. The valid and reliable 58-item Chinese Version of the PPE Scale is a tailor-made instrument for measuring the contexture of nursing practice environment in Taiwanese acute care hospitals. Although the factor structure and item groupings of the 58-item Chinese Version of the PPE Scale were different from the original English version of the PPE Scale, a cross-culturally comparison of the nursing practice environment between American and Taiwanese acute care hospitals could be fulfilled by analyzing the data of the 35 PPE items on an item-by-item base, because the 58-item Chinese Version of the PPE Scale contains 35 items from original English version of the PPE Scale.

Implications for Health Policies

Nurses working in an environment unsupportive to nursing professional practice could be unable to engage with patients and deliver quality patient care. Hence, transforming the professional practice environment to allow nurses to provide patients with quality patient care to contribute to better patient outcomes should be aggressively and urgently addressed. In order to echo ICN's appeal for improving nursing practice environment, Taiwan Nurses Association aggressively investigated the perceived practice environment of nurses in Taiwan (Lee, et al., 2008). However, the implications of the survey results were limited because of the lack of the psychometric properties of the survey instrument. International Council of Nurses' (ICN) position statement (2000) highlighted that nurses can and should contribute to public policy pertaining to the determinants of health. Nurses' abilities to individually and collectively influence public

policy, institutional practice, professional organization, and community action determine the strength of nursing profession (Mason, & Talbott, 1985). This study produced a valid and reliable 56-item Chinese version of the PPE Scale. In the future, the utilization of this valid and reliable scale in evaluating the practice environment of nurses could possibly make contributions to heath policies. For example, by continuously using the valid and reliable 56-item Chinese version of the PPE Scale to evaluate the practice environment of nurses, the evaluation results could provide the nursing administers with significant evidence-based information while making policies of innovations in the practice environment of nurses. Also, nursing leaders could utilize the survey results to communicate with the policy-makers, health care providers or the public to shape health policy by arousing people's awareness of taking nursing professional practice environment into account while relevant policies are made.

Lessons Learned and Auxiliary Finding

This study utilized multiple strategies to pursue a best translation of the PPE Scale that could be applied in a different culture. Through the translation and adaptation processes, this study specifically revealed that the communication with the instrument developer could significantly help the researcher ensure the meaning of test items to be well preserved during the translating and adapting an instrument into a different culture. In literatures, it's a common phenomena that a researcher inquired the permission of using a instrument form the tool developer and then simply translate/adapt an instrument without further discuss the results with original tool developer. The lack of

communication between the researcher and the tool developer sometimes could run into the risk of producing an instrument which is no longer same as the original one. However, little attention was paid on this issue. Keeping the meanings of test items nearly similar across different language versions is a critical issue in translating an instrument into a different language for cross-cultural research (Brislin, 1970). To ensure the meanings of test items could be well preserved across cultures/language, construct open communication between the researcher and the tool developer should be emphasized.

Since ICN (2007) made an appeal for all National Nursing Associations to focus on improving practice environment and protecting nursing staff, improvement in the practice environment of nurses has been the focus in Taiwan. Understanding the attributes of the practice environment is an important antecedent to improving the environment. Constructing a survey with nurses by using a reliable and valid instrument to measure the hospital could be an easy way to approach the environment. However, this study noted that using an instrument to quantifying the practice environment might be insufficient. For example, the descriptive results showed that the participants' responses to the 4-point Likert scale of each of items on the 58- items Chinese PPE Scale ranged from 2.31 (Item 8, Item 56) to 3.13 (Item 31). Using score of 2.5 as a cut point, 7 of the 58 items were scored less than 2.5. The average score of the total 58- items Chinese PPE Scale was 2.84. Nurses perceived that the excellent attributes of nursing practice environment somewhat existed in their work environment. Though nurses rated acceptable scores on the PPE Scale, but almost all of them wrote negative comments on their practice environment.

This information raised the concern about that simply focusing on the ″score″of the environment could possible mislead the results. In fact, some important findings emerged through simultaneously analyzing the quantitative and qualitative data in this study. The descriptive analyses showed that the top three items with low average score on the 58-items Chinese PPE Scale were Item 8 (*M*=2.31), Item 56 (*M*=2.31), and Item 10 (*M*=2.36). Among these three items, Item 8 (This unit has enough staff nurses to provide quality patient care) and Item 10 (This unit has enough staff nurses to get the patient care work done) reflected the adequacy of nursing manpower. Item 56 (This hospital provides multilingual health care brochures/sheets for nurse in clinical practice) focused on the adequacy of materials. This survey data pointed out the problems in staffing and materials. Interestingly, it was noted that shortage of nursing manpower was the most popular comments but none of nurses commented on the lack of multilingual health care materials. The result reflected that shortage of nursing manpower was really a critical issue needed to be improved. The low average score of Item 56 came indicated that multilingual health care brochures/sheets were not available for nurse. However, the comments supported that the lack of multilingual materials was not urgent to be improved because it's very rare for a nurse to take care of patients using a language different from Chinese. This example supported the use of combined quantitative and qualitative method could better capture the contexture of nursing practice environment. .

Recommendations for Future Studies

The sample of this study was mainly recruited from 4 private hospitals located in

the northern area in Taiwan. A survey constructed in Taiwan by Lee and colleagues (2008) indicated that the perceived practice environment among nurses was significantly among the geographical location and the classification of nurses' work hospitals. Nurses working in the southern region in Taiwan reported higher satisfaction with their practice environment. Because the sampling of this study was limited in a specified geographical region and specified type hospitals, further replicating this study with selecting more heterogeneous and representative sample is needed to increase the generalizability of the results.

In western countries, several instruments have been developed to measure the attributes of nursing practice environment (Lake, 2007). However, in Taiwan, an instrument that is constructed by theory-based domains and Taiwanese culture and has already established sound psychometric properties is limited. This study is the first one translating and culturally adapting a Western-cultural instrument and establishing sound psychometric properties of the instrument to measure nursing practice environment in Taiwan. To accumulate evidence for the 58-iem Chinese version of the PPE Scale on going studies to asses the scale and its derivatives are needed.

Some themes emerging from nurses' comments in this study could be used to further revise the 58-iem Chinese version of the PPE Scale. For example, the analyses of nurses' comments showed that poor nurse staffing, work overload, too many non-nursing tasks, inadequate resources for patient care, and de-specialized unit within the practice environment could threaten patient quality of care. Meanwhile, demanding working

conditions, poor welfare and salary, inadequate resources for professional development, unsafe work environment, unsupportive managers, poor nurse-physician relationship, poor peer supports, nursing profession being devalued, and limited nursing autonomy within the practice environment would also led to poor nurse satisfaction and retention. Because the original PPE Scale and the 58-item Chinese version of the PPE Scale did not have sufficient items to address cover the issues related to staffing, workload, welfare and salary, and safety of the work environment. In the future, adding items to measure these relevant issues could be taken into account while revising the Chinese PPE Scale.

Assuming the universality of a concept across different cultures is one of the risks of cross-cultural research (Marin & Marin, 1991). Munet-Vilaro and Egan (1990) indicated that factors assumed to be components of concepts and values developed on the test tool may differ across cultures. Because of the different psychometric structure between the English and Chinese versions of the PPE Scale, the variance in conceptualization of the nursing practice environment might need to be explored. So far, the concept of Magnet hospital is popular used in Taiwan as resources to define nursing practice environment. The use of qualitative research to capture Taiwanese nurses' perceptions of the practice environment is lacking. Further research is suggested by utilizing qualitative methods to extract the important attributes which are specific to Taiwanese nursing practice environment. For example, this study included an open-ended question to allow the participants to address issues about their practice environment. The results showed that a survey with open-ended question could give nurses the opportunity

to express thoughts and concerns. The content analyses of the comments revealed some issues particularly concerned by Taiwanese nurses with regard to the practice environment such as workload, nurse-patient ratio and nurse manpower allocation in staffing, salary and welfare, and nurses' quality of life. However, these issues were not assumed to be covered in the original PPE Scale or even in the translated-adapted Chinese version of the PPE Scale which had been validated by nursing experts and leaders. The findings raised the concern about the importance of identifying Taiwanese nurses' thoughts on what attributes a professional practice environment should be in Taiwan. Better capturing the important attributes of a professional practice environment from Taiwanese nurses views could facilitate the improvement of the environment of care for nurses. Further qualitative study by interviewing staff nurses reporting extremely high or low scores to indentify the attributes of the professional practice environment in Taiwan was suggested. The data abstracted from an open-ended question in this study could possibly serve as resources for constructing interview questions in the future qualitative research.

Because of adding items into the original PPE Scale, three domains specific to Taiwanese culture were found in the 58-iem Chinese version of the PPE Scale. Further utilization of the 58-iem Chinese version of the PPE Scale in Weston country is also suggested to accumulate knowledge of etic-emic nursing practice environment across cultures

Conclusion

The study aimed to translate the English version of the PPE Scale into Chinese language, culturally adapt it and establish its psychometric properties to facilitate its usability in Taiwan. Through the rigid translation, adaptation, and psychometric evaluation processes, the 58-item Chinese version of the PPE Scale was produced and its validity and reliability were secured. The 58-item Chinese version of the PPE Scale was composite of 11 domains and demonstrated satisfactory construct validity, concurrent validity, internal consistency and test-retest reliability. The scale is a valid and reliable instrument sensitive to Taiwanese culture and could be utilized to measure Taiwanese nursing practice environment in acute care settings. This study has implications in nursing practice, education, and research. The utilization of the 58-item Chinese version of the PPE Scale in evaluating nursing practice environment could allow the leadership to better understand and develop effective strategies to improve the practice environment for nurses in the future. The methodologies of this study can also provide evidence and knowledge in translation, adaptation and development of instruments. Further studies are recommended to augment the application of the 58-item Chinese version of the PPE Scale and increase the knowledge in measurement and conceptualization of the nursing practice environment.

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Appendix A
Letters of Applying for PPE Scale and Permission

BOSTON COLLEGE

WILLIAM F. CONNELL SCHOOL OF NURSING

Dr. Trish Gibbons RN DNS
Associate Chief – Center for Clinical and Professional Development
Massachusetts General Hospital, Founders 6
55 Fruit Street
Boston, MA 02114
October 01, 2004

Dear Dr. Gibbons,

My name is Chia-Chuan Chang. I am currently a doctoral student at Boston College William F. Connell School of Nursing. I come from Taiwan and am interested in studying Taiwanese nurses' satisfaction with the professional practice environment in acute care settings. The focus of my doctoral dissertation is to translate and develop the psychometric properties of a Chinese version of the Professional Practice Environment (PPE) scale to evaluate nurses' satisfactions with the professional practice environment.

I know that the original version of the PPE scale has been developed by Jeanette Ives-Erickson, Vice President for Patient Care Services, Dr. Mary Duffy, Dr. Joan Fitzmaurice, Marianne Ditomassi, Dr. Dorothy Jones, and you. I also know that you have been testing the tool at the Massachusetts General Hospital Patient Care Services for the past four years and to date the psychometric properties of the PPE scale indicate that the tool is reliable and valid.

In order to develop the Chinese version of the PPE scale, I am requesting your permission to use the PPE scale in my doctoral dissertation. With the concern of cultural sensitivity, the PPE scale will be translated and modified as needed into Chinese and be used it in my doctoral dissertation with Taiwanese nurses working in a large acute care medical center. I look forward to hearing back from you regarding permission to use the Professional Practice Environment (PPE).

Sincerely yours,

Chia-Chuan Chang

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Jeanette Ives Erickson, RN, MS
Senior Vice President
Chief Nurse

Date

To whom it may concern,

Thank you for your interest in the ***Professional Practice Environment (PPE) Scale.*** You may use the PPE scale for research or evaluation projects provided the scale is not altered in any manner and the authors are acknowledged in any and all reports or publications.

The ***PPE*** scale is intended to measure the staffs' perception of eight components of the professional clinical practice environment in the acute care setting. The psychometric properties of this scale have been published in the *Journal of Nursing Scholarship.*[1]

For your use of this scale, we request that you provide us with:

- an abstract of your study that includes sample size and sample characteristics,
- a table reflecting the internal consistency and, if applicable, other reliability coefficients of the subscales for your sample and
- a list of publications reporting use of the scale.

Enclosed in this packet are a copy of the current version of the scale, directions for scoring the scale and a request for information. Please complete the request for information form that describes how you plan to use the scale in your current work and return it by fax as directed on the form.

Thank you again for your interest in this work. We ask that all communications concerning the use of the scale be sent to Trish Gibbons RN, DNSc, Associate Chief for The Knight Nursing Center or you can email it to tgibbons@partners.org.

We wish you success with your research endeavor and look forward to reading your results. Please feel free to connect with us regarding any questions you may have.

Sincerely,

Jeanette Ives Erickson

Cc: Trish Gibbons, RN, DNSc

[1] Ives Erickson, J., Duffy, M., Gibbons, M. P., Fitzmaurice, J., Ditomassi, M., Jones, D. (2004, Third Quarter). Development and psychometric evaluation of the professional practice environment (PPE) scale. *Journal of Nursing Scholarship*, 279-285.

Appendix B
Sample of Forward Translation Sheets

Forward Translation Guide

Conceptual rather than literal meaning is the goal of translation in this study. You are asked to translate the PPE Scale into Chinese with the consideration of the cultural issue and the meanings of the terms used in Taiwanese culture.

The brief introduction about the original English of the PPE Scale is provided to help you better understanding this instrument. The original English of the PPE Scale is provided and well organized in the source language columns as attached materials. Please carefully read every concept, item and response word-by word first. Then, please choose the meaningful terms that can best reflect the concept of the original item and also fit in Taiwanese cultural with the concern with the following guidelines for translation:

1. Please translate the meaning of the statement rather than the word-by-word translation.
2. Please choose Chinese Mandarin words that best convey the intent of an item and is easily understandable in translation

Please try to completely translate every statement as provided. Comments areas are provided to note any word or phrase that are difficult to translate into Chinese as needed. Please describe possible ways of translating the problem contents, and indicate your preferred translation and describe any concerns.

Following is an example about how to fill this translation sheet. Please use the contents in the source language column as a standard to translate them into the target language. Please write the translation results in the target language column. For example, English content A is the standard. The content B will be your translation results. If you find any difficulty in translating content A, describe your suggestions and concerns as content C.

Source Language	Target Language	Comments for Difficult Translation
English	Chinese	Contents
A	B	C possible ways of translating: preferred translation and why?

Forward Translation Sheet

Concept 1: Handling disagreement and conflict

Definition: The degree to which managing discord is addressed using a problem-solving approach

	Source Language	Target Language	Comments for Difficult Translation Contents
	English	Chinese	
Concept	Handling disagreement and conflict		possible ways of translating: preferred translation and why?
Definition	The degree to which managing discord is addressed using a problem-solving approach		possible ways of translating: preferred translation and why?
Question	21. When staff disagree, they ignore the issue, pretending it will go away.		possible ways of translating: preferred translation and why?
Question	22. Staff withdraw from conflict.		possible ways of translating: preferred translation and why?

Appendix C
Sample of Translation Equivalence Questionnaire for Original English and Translated Chinese Versions of the PPE Scale

Review Guide

Attached are the original English and the translated Chinese version of the PPE Scale. Please share with me your opinions about the equivalence between these two versions. Each of items is placed on a 4-point Likert scale of 1 (totally different), 2 (the item needs major revision to be equivalent), 3 (the item needs minor revision to be equivalent), and 4 (equivalent) for participants' responses. Please circle the number that best reflects the extent to which the translation equivalence is. Comments areas are provided. Please give recommendations for revise whose translation equivalences are rated less than 4. .

The translators were asked to translate the PPE Scale into Chinese with the consideration of the cultural issue and the meanings of the terms used in Taiwanese culture. Namely, conceptual rather than literal meaning is the goal of translation in this study. Please evaluate the translation equivalence with the goal of translation in this study in mind.

Following is an example about how to rate the translation equivalence. Please use the contents in the standard column as criteria to evaluate if the comparison content is equivalent to the standard or not. For example, content A is the standard. If you feel that the content B needs a minor revision to be equivalent to content A, you circle the number "3" and describe suggestions for revising the content B.

Standard	Comparison	Evaluation of Equivalence
Original English version	Translated Chinese Version	
A	B	1 2 3 4 Comments:

Translation Equivalence Questionnaire for Original English and Translated Chinese Versions of the PPE Scale

Concept 1. Handling disagreement and conflict

Definitions: The degree to which managing discord is addressed using a problem-solving approach.

Direction: Please circle the number that best reflects the extent to which the translation equivalence is.

Equivalence

1= totally different

2= the item needs major revision to be equivalent

3= the item needs minor revision to be equivalent

4= equivalent

	Standard	Comparison	Evaluation of Equivalence
	Original English version	Translated Chinese Version	
Concept	Handling disagreement and conflict	處理意見不合和衝突	1 2 3 4 Comments:
Definition	The degree to which managing discord is addressed using a problem-solving approach	使用解決問題的方法來處理意見不合的程度	1 2 3 4 Comments:
Question	21. When staff disagree, they ignore the issue, pretending it will go away.	21.當護理人員意見不合時，他們會忽略問題，假裝問題將會消失不見	1 2 3 4 Comments:
Question	22. Staff withdraw from conflict.	22.護理人員會從衝突中退出。	1 2 3 4 Comments:

Appendix D
Sample of Monolingual Reviewer Questionnaire for the Translated Chinese Version of the PPE Scale

審查指引|**Review Guide**

中文版專業實務環境量表共計 38 題，每題均包含一個四分計法的反應選項(4 分-非常同意、3 分-同意、2 分-不同意、1 分：非常不同意)可供受訪的護理人員(護理主管除外)能根據個人臨床工作環境現況，勾選個人對題目陳述內容的同意程度。未來中文版專業實務環境量表於台灣臨床施測時，爲了確保受訪者能瞭解量表內容來進行作答，懇請您考量台灣文化的用詞及意義，協助協助審查中文版專業實務環境量表中 38 題題目陳述內容的可瞭解性、清晰性、及可閱讀性。

茲檢附二份中文版專業實務環境量表，審查標準說明亦詳述於各評量表中。此次審查作業包含兩階段，第一階段爲題目的可瞭解性、清晰性、及可閱讀性三部分之評值；第二階段爲題意之評值。首先，請您針對「**中文版專業實務環境量表之可瞭解性、清晰性、及可閱讀性審查表**」中，每一題題目的可瞭解性、清晰性、及可閱讀性三部分進行審閱。請您在接獲 38 題的中文版專業實務環境量表時，假想自己是位受訪者正在作答問卷，但是您並不需要勾選個人對題目陳述內容的同意程度。您只需要在閱讀每一個題目後，於評值欄中勾選您所認爲可以反應出該題可瞭解性、清晰性、及可閱讀性程度的評值分數即可。各項評值標準說明如下：

1.可瞭解性：是指當讀者閱讀時，該項目的意思是否容易被瞭解的程度

2.清晰性：是指該項目的措辭是否合宜的程度

3.可閱讀性：是指該項目是否容易被閱讀的程度

可瞭解性、清晰性、及可閱讀性程度的評值分數等級包含 4 級，滿分 4 分表示該題的可瞭解性、清晰性、或可閱讀性程度佳；3 分表示該題需要再小幅度修正；2 分表示該題需要再大幅度修正；1 分則表示該題的可瞭解性、清晰性、或可閱讀性程度極差。請您針對評值分數未達 4 分的項目，提供修正的寶貴意見(如有需要修正者，請於修正意見欄或題目旁的空白處註明建議修正的意見)。最後，爲了確保題目的意思能爲受訪者所瞭解，請您再次閱讀「**中文版專業實務環境量表之題意審查表**」中的每一個題目，並於閱讀題目後，於**「題意」欄位**中，簡述您個人認爲該題所要問的問題內容爲何!

本次審查作業需要耽誤您部分個人時間，爲了發展符合台灣文化背景的中文版專業實務環境量表，本研究非常需要您的參與，感謝您願意撥冗作答並提供寶貴意見。

中文版專業實務環境量表審查資料表 (共計二份，共含 8 頁)

受訪者基本資料：(本部分資料於本研究報告中將僅以數字方式呈現，以保護受訪者個人隱私權，請您放心填寫)

1.工作經歷：加護病房___年___月 / 普通病房___年___月 / 急診__年__月/ 其他單位 ____(請註明)___年__月

2.最高學歷：□ 五專 □ 二專 □ 大學 □ 研究所

3.性別：□ 女 □ 男

4.目前服務單位名稱:_____

中文版專業實務環境量表之可瞭解性、清晰性、及可閱讀性審查表

請圈選您所認爲可以反應出該題可瞭解性、清晰性、及可閱讀性程度的評值分數。

1.可瞭解性：指當讀者閱讀時，該項目的意思是否容易被瞭解的程度

評分等級:
4 分：該項目是容易被瞭解的
3 分：該項目需要再小幅度修正才能容易被瞭解
2 分：表示需要再大幅度修正才能容易被瞭解
1 分：該項目是不容易被瞭解的

2.清晰性：指該項目的措辭是否合宜的程度

評分等級:
4 分：該項目的措辭是合宜的
3 分：該項目的措辭需要再小幅度修正才是合宜的
2 分：該項目的措辭需要再大幅度修正才是合宜的
1 分：該項目的措辭是不合宜的

3.可閱讀性：指該項目是否容易被閱讀的程

評分等級:
4 分：該項目是容易被閱讀的
3 分：該項目需要再小幅度修正才是容易被閱讀的
2 分：表示需要再大幅度修正才是容易被閱讀的
1 分：該項目是不容易被閱讀的

題　　目	可瞭解性	清晰性	可閱讀性	修正意見 (未達 4 分的項目，請提供寶貴意見)
1 護理長支持單位的護理人員	1 2 3 4	1 2 3 4	1 2 3 4	
2 護理掌控自己本身的業務	1 2 3 4	1 2 3 4	1 2 3 4	
3 具有對病人照護和工作做重要決策的自由	1 2 3 4	1 2 3 4	1 2 3 4	
4 醫生們和護理人員之間有很多團隊合作	1 2 3 4	1 2 3 4	1 2 3 4	
5 具有促進照顧連續性的病患照護工作分派	1 2 3 4	1 2 3 4	1 2 3 4	
6 有足夠的支持性服務使我能將時間放在病人身上	1 2 3 4	1 2 3 4	1 2 3 4	

中文版專業實務環境量表之題意審查表

請您再次閱讀「**中文版專業實務環境量表之題意審查表**」中的每一個題目，並於閱讀題目後，於「**題意」欄位**中，請你針對該題目所要問的意思爲何，簡述您個人的想法!

題　　目	**題　　意** (本題目所要問的意思爲何? 請簡述)
1 護理長支持單位的護理人員	
2 護理掌控自己本身的業務	
3 具有對病人照護和工作做重要決策的自由	
4 醫生們和護理人員之間有很多團隊合作	
5 具有促進照顧連續性的病患照護分派工作	
6 有足夠的支持性服務使我能將時間放在病人身上	

Appendix E
Sample of Back-Translation Sheets

Backward Translation Guide

Conceptual rather than literal meaning is the goal of translation in this study. You are ask to back-translate the PPE Scale from Chinese into English with the consideration of the cultural issue and the meanings of the terms used in American culture

The translated Chinese version of the PPE Scale is provided and organized in the source language columns as attached materials. Please carefully read every item and response word-by-word first. Then please choose the meaningful terms that can best reflect the concept of the original item and also fit in American cultural with the concern with the following guidelines for translation:

1. Please use the provided Chinese PPE Scale as source language for translation without any effort in trying to inference the written structure of the original English PPE Scale.
2. Please translate the meaning of the statement rather than the word-by-word translation.
3. Please choose easily understandable English words that best convey the intent of an item

Please completely translate every statement as provided. Comments areas are provided to note any word or phrase that are difficult to translate into English as needed. Please describe possible ways of translating the problem contents, and indicate your preferred translation and describe any concerns.

Following is an example about how to fill this translation sheet. Please use the contents in the source language column as a standard to translate them into the target language. Please write the translation results in the target language column. For example, content A is the standard; then content B will be your translation results. If you find any difficulty in translating content A, describe your suggestions and concerns as contents C.

Source Language	Target Language	Comments for difficult translation contents
Chinese	English	
A	B	C possible ways of translating: preferred translation and why?

Backward Translation Sheet

Concept 1: Handling disagreement and conflict

Definition: The degree to which managing discord is addressed using a problem-solving approach

	Source Language	Target Language	Comments for Difficult Translation Contents
	Chinese	English	
Concept	處理意見不合和衝突		possible ways of translating: preferred translation and why?
Definition	使用解決問題的方法來處理意見不合的程度		possible ways of translating: preferred translation and why?
Question	21 當護理人員意見不合時，他們會忽略問題，假裝問題將會消失不見		possible ways of translating: preferred translation and why?
Question	22 護理人員會從衝突中退出		possible ways of translating: preferred translation and why?

Appendix F

Sample of Translation Equivalence Questionnaire for Translated Chinese and Back-Translated English Versions of the PPE Scale

Review Guide

Attached are the translated Chinese and the back-translated English and versions of the PPE Scale. Please share with me your opinions about how equivalence between these two versions. Each of items is placed on a 4-point Liker scale of 1 (totally different), 2 (the item needs major revision to be equivalent), 3 (the item needs minor revision to be equivalent), and 4 (equivalent) for participants' responses. Please circle the number that best reflects the extent to which the translation equivalence **exists**. Comments areas are provided. Please give recommendations for **revisions for items** whose translation equivalences are rated less than **4.**

The translators were asked to translate the PPE Scale from Chinese into English with the consideration of the cultural issue and the meanings of the terms used in American culture. Namely, conceptual rather than literal meaning is the goal of translation in this study. Please evaluate the translation equivalence with the goal of translation in this study.

Following is an example about how to rate the translation equivalence. Please use the contents in the standard column as criteria to evaluate if the comparison content is equivalent to the standard or not. For example, content A is the standard. If you feel that the content B needs a minor revision to be equivalent to content A, you circle the number "3" and describe suggestions for revising the content B.

Standard	Comparison	Evaluation of Equivalence
Translated Chinese version	Back-translated English Version	
A	B	1 2 3 4 Comments:

Translation Equivalence Questionnaire of Translated Chinese and Back-translated English Versions of the PPE Scale

Concept 1. Handling disagreement and conflict

Definitions: The degree to which managing discord is addressed using a problem-solving approach.

Direction: Please circle the number that best reflects the extent to which the translation equivalence is.

Equivalence

1= totally different

2= the item needs major revision to be equivalent

3= the item needs minor revision to be equivalent

4= equivalent

	Standard	Comparison	Evaluation of Equivalence
	Translated Chinese version	Back-translated English Version	
Concept	處理意見不合和衝突	Handling disagreements and conflicts	1 2 3 4 Comments:
Definition	使用解決問題的方法來處理意見不合的程度	The degree of using a problem-solving approach to manage disagreement.	1 2 3 4 Comments:
Question	21 當護理人員意見不合時，他們會忽略問題，假裝問題將會消失不見。	When staff nurses disagree, they will ignore the problem and pretend that the problem will go away.	1 2 3 4 Comments:

Appendix G
Sample of Translation Equivalence Questionnaire for Original English and Back-Translated English Versions of the PPE Scale

Review Guide

Attached are the original English and the back-translated English versions of the PPE Scale. Conceptual rather than literal meaning is the goal of translation in this study. The forward translators have been asked to translate the PPE Scale into Chinese with the consideration of the cultural issues and the meanings of the terms used in Taiwanese culture. Similarly, the back-translators have been asked to translate the Chinese PPE Scale into English with the consideration of the cultural **issues** and the meanings of the terms used in American culture.

Please share with me your opinions about the equivalence between these two versions. Each of items is placed on a 4-point Likert scale of 1 (totally different), 2 (the item needs major revision to be equivalent), 3 (the item needs minor revision to be equivalent), and 4 (equivalent) for participants' responses. Please circle the number that best reflects the extent to which the translation is equivalent. Comments areas are provided. Please give recommendations for revisions for items whose translation equivalences are rated less than 4.

Following is an example about how to rate the translation equivalence. Please use the contents in the standard column as criteria to evaluate if the comparison content is equivalent to the standard or not. For example, content A is the standard. If you feel that the content B needs a minor revision to be equivalent to content A, you circle the number "3" and describe suggestions for revising the content B.

Standard	Comparison	Evaluation of Equivalence
Original English version	Back-translated English Version	
A	B	1 2 3 4 Comments:

Translation Equivalence Questionnaire for Original English and Back-Translated English Versions of the PPE Scale

Concept 1. Handling disagreement and conflict

Definitions: The degree to which managing discord is addressed using a problem-solving approach.

Direction: Please circle the number that best reflects the extent to which the translation equivalence is.

Equivalence

1= totally different

2= the item needs major revision to be equivalent

3= the item needs minor revision to be equivalent

4= equivalent

	Standard	Comparison	Evaluation of Equivalence
	Original English version	Back-Translated English Version	
Concept	**Handling disagreement and conflict**	Handling disagreements and conflicts	1 2 3 4 Comments:
Definition	The degree to which managing discord is addressed using a problem-solving approach	The degree of using a problem-solving approach to manage disagreement.	1 2 3 4 Comments:
Question	21. When staff disagree, they ignore the issue, pretending it will go away.	When staff nurses disagree, they ignore the problem and pretend that the problem will go away.	1 2 3 4 Comments:
Question	22. Staff withdraw from conflict.	Staff nurses withdraw from conflict.	1 2 3 4 Comments:

Appendix H
Sample of Back-Translated English Version of PPE

Demographic Data

The following items will be transformed as numbers for presentation to protect your confidentialities. All the information will not be used to identify specific individuals. No one will have access to your answers except the researcher of this study. Please feel free to complete this questionnaire. Please fill in /select one answer for every item. Thanks.

1. How long have you been a nurse? _____Years_____Months
2. What is your highest education degree?
   ☐ 1. Diploma ☐ 2. Bachelors ☐ 3. Master ☐ 4. Doctorate
3. Gender: ☐ 1. Male ☐ 2. Female
4. Age: _____
5. What is the main unit where you currently work? _____
6. What is your tile in the hospital where you currently work? _____
7. **The unit you have selected for evaluating its environment in the first run survey is:**

_____

Directions:

Many people work at different settings in the same time**. Please select the unit that you currently mainly work for as the target for evaluating its environment.**

Attached is the Professional Practice Environment Scale (PPE Scale). Please share with me your opinions about the environment where you currently practice nursing now. Each of items is placed on a 4-point Liker scale of 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree) for participants' responses.

Please circle **one** number that best reflects the extent to which you agree or disagree with the statement. There are no right or wrong answers. Please feel free to complete every item.

PROFESSIONAL PRACTICE ENVIRONMENT SCALE (B)

Direction:

Please read each of the items as followings and circle the number that best reflects the extent to which you agree or disagree with the statement. There are no right or wrong answers.

Items	Strongly Disagree	Disagree	Agree	Strongly Agree
1. Working in this unit gives me opportunity to gain new knowledge and skills.	1	2	3	4
2. I am motivated to do the best job because I am empowered by my work environment.	1	2	3	4
3. Working in this environment increases my feeling of professional growth.	1	2	3	4
4. Head nurse supports staff nurses in the unit.	1	2	3	4
5. Staff nurses in this unit are sensitive to the diverse patient populations whom they serve.	1	2	3	4
6. In this unit, disagreements between staff nurses are ignored or avoided.	1	2	3	4
7. The staff nurses involved settle the disagreement by consensus.	1	2	3	4
8. There are good working relationships between doctors and this unit.	1	2	3	4

Appendix I
Sample of Translated Chinese Version of the PPE Scale

受訪者基本資料：(本部分資料於本研究報告中將僅以數字方式呈現，以保護受訪者個人隱私權，請您放心填寫)

1.請問到目前爲止您已經擔任護理人員的年資： _____年 _____月

2.最高教育程度： □ 專科 □大學 □碩士

3.性別：□ 女 □ 男

4.目前服務單位名稱:_____

5.目前職稱:_____

6.年齡:_____

說明:

以下問卷主要是調查您目前所處的護理工作環境現況。請您以個人目前工作單位現況爲考量，就您個人對問卷題目所陳述的內容的同意或不同意程度，圈選出一個最符合您實際情形的答案。

評值分數等級包含 4 級，滿分 4 分表示您對該題的陳述「非常同意」； 3 分表示您對該題的陳述「同意」; 2 分表示您對該題的陳述「不同意」; 1 分則表示您對該題的陳述「非常不同意」。您的答案代表您個人對問卷題目所陳述的內容的同意或不同意程度，絕對沒有所謂的對或錯之分，請您盡量完成作答。謝謝!

本研究非常需要且相當重視您的專業意見，懇請您於翻頁作答前，再次檢視當頁的作答是否已完整。非常謝謝您的協助，感謝您撥冗審視本問卷以及提供寶貴意見。

請依序先完成英文問卷作答後，再填寫中文問卷。謝謝!

專 業 實 務 環 境 量 表

請您逐題詳細閱讀後，依據個人的工作現況，就題目所陳述的內容是否符合您個人的工作現況，圈選出一個最符合您實際情形的答案。答案沒有所謂的對或錯之分。

	非常不同意	不同意	同意	非常的同意
1 本單位有足夠的護理人員來提供具有品質的病人照護。	1	2	3	4
2 我具有對病人照護和工作做重要決策的自由。	1	2	3	4
3 本單位有足夠的護理人員來完成病人照護工作。	1	2	3	4
4 我有足夠的時間和機會與其他的醫療人員討論照護病人的問題。	1	2	3	4
5 我沒有被放在必須違背自己專業判斷做事的處境。	1	2	3	4
6 在本單位裏，病人照護的工作分派促進了照護的連續性。	1	2	3	4
7 當我需要病人狀況的相關資訊時，我就能得到。	1	2	3	4
8 本院有足夠的支持性服務(例如：社會服務部門、轉送中心、醫事部門…等)，使我能將時間放在病人身上。	1	2	3	4

Appendix J

Sample of Content Validity Questionnaire of the Translated Chinese Version of the PPE Scale for Taiwanese Experts

審查指引| Review Guide

檢附的評量表共計 38 題，已依照原始專業實務環境量表的 8 項核心概念結構及定義與以歸類呈現，而審查標準說明亦詳述於各評量表內，以方便您審閱。

請您在檢附的評量表上，除了針對每一題題目的可相關性、代表性、清晰性、及可閱讀性四構面，以及每一項核心概念是否完整地涵蓋相關的重要概念，進行審閱外，也請您評量整份問卷是否已經完整地涵蓋與台灣專業實務環境量有關的重要概念。

各項評值標準說明如下：

1.相關性：該項目與概念之間的相關程度

2.代表性：該項目可以反應出概念內涵的程度

3.清晰性：是指該項目措辭合宜的程度

4.可閱讀性：是指該項目容易被閱讀的程度

5.項目完整性：是指題目的數量足夠用來完整地反應概念內涵的程度

6.概念完整性：是指概念的數量足夠用來反應台灣急性醫療體系內護理人員專業實務環境的程度

各項評值分數等級包含 4 級，滿分 4 分表示該題的相關性、代表性、清晰性、可閱讀性及完整性佳；3 分表示該題需要再小幅度修正；2 分表示該題需要再大幅度修正；1 分則表示該題的相關性、代表性、清晰性、可閱讀性及完整性極差。

請您在閱讀每一個題目後，於評值欄中勾選您所認爲可以反應出該題的相關性、代表性、清晰性、可閱讀性及完整性程度的評值分數。懇請您針對評值分數未達滿分 4 分的項目，於修正意見欄或題目旁的空白處註明建議修訂的寶貴意見。

謝謝!

中文版專業實務環境量表之內容效度審查表-概念五.護理人員和醫師們之間的關係

請圈選您所認爲可以反應出該題相關性、代表性、清晰性及可閱讀性程度的評值分數。 相關性、代表性、清晰性、可閱讀性及完整性

1.相關性：該項目與概念之間的相關程度

評分等級:
4分：該項目與概念之間是非常有相關的
3分：該項目與是概念之間是相當有相關的
2分：該項目與概念之間是有點有相關的
1分：該項目與概念之間是不相關的

2.代表性：指該項目可以反應出概念內涵的程度

評分等級:
4分：該項目可以反應出概念內涵
3分：該項目需要再小幅度修正才能反應出概念內涵
2分：該項目需要再大幅度修正才能反應出概念內涵
1分：該項目不可以反應出概念內涵

3.清晰性：指該項目措辭合宜的程度

評分等級:
4分：該項目的措辭是合宜的
3分：該項目的措辭需要再小幅度修正才是合宜的
2分：該項目的措辭需要再大幅度修正才是合宜的
1分：該項目的措辭是不合宜的

4.可閱讀性：指該項目容易被閱讀的程度

評分等級:
4分：該項目是容易被閱讀的
3分：該項目需要再小幅度修正才是容易被閱讀的
2分：表示需要再大幅度修正才是容易被閱讀的
1分：該項目是不容易被閱讀的

概念五.護理人員和醫師們之間的關係 『定義：促進重要臨床資訊交流的醫護關係』 此概念共含 2 題題目

題 目	相關性	代表性	清晰性	可閱讀性	修正意見 (未達 4 分者，請提供意見)
4 醫師們和護理人員之間有很多團隊合作	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
13 醫師們和本單位之間有良好的工作關係。	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	

5.項目完整性：題目的數量足夠用來完整地反應概念內涵的程度

閱讀完以上測量『**護理人員和醫師們之間的關係**』概念的 2 題題目後，您覺得該概念所囊括的題目數量的完整性爲何呢? 請勾選!

□ 1 題目的數量不足夠用來完整地反應概念內涵
□ 2 需要再增加大量的題目，題目的數量才足夠用來完整地反應概念內涵
□ 3 需要再增加少量的題目，題目的數量才足夠用來完整地反應概念內涵
□ 4 題目的數量足夠用來完整地反應概念內涵

請於以下空白處，說明您認爲應該增納此概念下的題目!

中文版專業實務環境量表之內容效度審查表-概念完整性

6.概念完整性：概念的數量足夠用來反應台灣急性醫療體系內護理人員專業實務環境的程度

整體而言，閱讀完以上測量專業實務環境的 9 個概念後，您覺得本問卷所囊括的概念是否能完整地評估台灣急性照護體系內護理人員的專業實務環境呢? 請勾選!

☐ 1 概念的數量不足夠用來完整地反應專業實務環境

☐ 2 需要再增加大量概念，概念的數量才足夠用來完整地反應專業實務環境

☐ 3 需要再增加少量概念，概念的數量才足夠用來完整地反應專業實務環境

☐ 4 概念的數量足夠用來完整地反應專業實務環境

請於以下空白處，說明您認爲應該增納於問卷中的其他重要相關概念及題目!

Appendix K

Sample of Content Validity Questionnaire of the Translated Chinese Version of the PPE Scale for Focus Group

審查指引| Review Guide

檢附的評量表共計 38 題，已依照原始專業實務環境量表的 8 項核心概念結構及定義與以歸類呈現，而審查標準說明亦詳述於各評量表內，以方便您審閱。

請您在檢附的評量表上，除了針對每一題題目的可相關性、代表性、清晰性、及可閱讀性四構面，以及每一項核心概念是否完整地涵蓋相關的重要概念，進行審閱外，也請您評量整份問卷是否已經完整地涵蓋與台灣專業實務環境量有關的重要概念。

各項評值標準說明如下：

1.相關性：該項目與概念之間的相關程度

2.代表性：該項目可以反應出概念內涵的程度

3.清晰性：是指該項目措辭合宜的程度

4.可閱讀性：是指該項目容易被閱讀的程度

5.項目完整性：是指題目的數量足夠用來完整地反應概念內涵的程度

6.概念完整性：是指概念的數量足夠用來反應台灣急性醫療體系內護理人員專業實務環境的程度

各項評值分數等級包含 4 級，滿分 4 分表示該題的相關性、代表性、清晰性、可閱讀性及完整性佳；3 分表示該題需要再小幅度修正；2 分表示該題需要再大幅度修正；1 分則表示該題的相關性、代表性、清晰性、可閱讀性及完整性極差。

請您在閱讀每一個題目後，於評值欄中勾選您所認爲可以反應出該題的相關性、代表性、清晰性、可閱讀性及完整性程度的評值分數。懇請您針對評值分數未達滿分 4 分的項目，於修正意見欄或題目旁的空白處註明建議修訂的寶貴意見。

謝謝!

中文版專業實務環境量表之內容效度審查表-概念七. 團隊合作

請圈選您所認爲可以反應出該題相關性、代表性、清晰性及可閱讀性程度的評值分數。 相關性、代表性、清晰性、可閱讀性及完整性

1.相關性：該項目與概念之間的相關程度

評分等級:
4分：該項目與概念之間是非常有相關的
3分：該項目與是概念之間是相當有相關的
2分：該項目與概念之間是有點有相關的
1分：該項目與概念之間是不相關的

2.代表性：指該項目可以反應出概念內涵的程度

評分等級:
4分：該項目可以反應出概念內涵
3分：該項目需要再小幅度修正才能反應出概念內涵
2分：該項目需要再大幅度修正才能反應出概念內涵
1分：該項目不可以反應出概念內涵

3.清晰性：指該項目措辭合宜的程度

評分等級:
4分：該項目的措辭是合宜的
3分：該項目的措辭需要再小幅度修正才是合宜的
2分：該項目的措辭需要再大幅度修正才是合宜的
1分：該項目的措辭是不合宜的

4.可閱讀性：指該項目容易被閱讀的程度

評分等級:
4分：該項目是容易被閱讀的
3分：該項目需要再小幅度修正才是容易被閱讀的
2分：表示需要再大幅度修正才是容易被閱讀的
1分：該項目是不容易被閱讀的

概念七. 團隊合作 『定義：以在追求共同目標時能達成團結努力爲目的的一種有意識的活動』 此概念共含 6 題題目

題 目	相關性	代表性	清晰性	可閱讀性	修正意見 (未達4分者,請提供意見)
17 本單位與醫院中其他的團隊間具有良好的工作關係。	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
18 本單位沒有從醫院中其他的單位獲得所需的合作。	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
19 醫院中其他的單位似乎對本單位的評價不高。	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
20 和醫院中其他的團隊的不良工作關係限制了本單位的工作效益。	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
52 在本單位裡，護理人員之間具有良好的工作關係。	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	
53 在本單位裡,護理人員之間互相合作以達成工作目標。	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	

5.**項目完整性**：題目的數量足夠用來完整地反應概念內涵的程度

閱讀完以上測量『**團隊合作**』概念的 6 題題目後，您覺得該概念所囊括的題目數量的完整性爲何呢? 請勾選!

□ 1 題目的數量不足夠用來完整地反應概念內涵

□ 2 需要再增加大量的題目，題目的數量才足夠用來完整地反應概念內涵

□ 3 需要再增加少量的題目，題目的數量才足夠用來完整地反應概念內涵

□ 4 題目的數量足夠用來完整地反應概念內涵

請於以下空白處，說明您認爲應該增納此概念下的題目!

中文版專業實務環境量表之內容效度審查表-概念完整性

6.**概念完整性**：概念的數量足夠用來反應台灣急性醫療體系內護理人員專業實務環境的程度

整體而言，閱讀完以上測量專業實務環境的 9 個概念後，您覺得本問卷所囊括的概念是否能完整地評估台灣急性照護體系內護理人員的專業實務環境呢? 請勾選!

□ 1 概念的數量不足夠用來完整地反應專業實務環境

□ 2 需要再增加大量概念，概念的數量才足夠用來完整地反應專業實務環境

□ 3 需要再增加少量概念，概念的數量才足夠用來完整地反應專業實務環境

□ 4 概念的數量足夠用來完整地反應專業實務環境

請於以下空白處，說明您認爲應該增納於問卷中的其他重要相關概念及題目!

Appendix L
Sample of Face Validity Questionnaire of the Chinese Version of the PPE Scale

審查指引| Review Guide

請您假裝自己正在參加問卷調查。首先，請您閱讀問卷首頁及研究參與同意書後，針對陳述內容的可瞭解性、清晰性、及可閱讀性。進行審查。接下來，請您完整作答「專業實務環境量表」的每個題目，並在問卷最後處紀錄下您作答問卷所花費的時間。最後，請您針對每題題目的可瞭解性、清晰性、及可閱讀性三部分進行審閱。請您在閱讀每一個題目後，於評值欄中勾選您所認爲可以反應出該題可瞭解性、清晰性、及可閱讀性程度的評值分數即可。各項評值標準說明如下：

1.可瞭解性：是指當讀者閱讀時，該項目的意思是否容易被瞭解的程度

2.清晰性：是指該項目的措辭是否合宜的程度

3.可閱讀性：是指該項目是否容易被閱讀的程度

可瞭解性、清晰性、及可閱讀性程度的評值分數等級包含 4 級，滿分 4 分表示該題的可瞭解性、清晰性、或可閱讀性程度佳；3 分表示該題需要再小幅度修正；2 分表示該題需要再大幅度修正；1 分則表示該題的可瞭解性、清晰性、或可閱讀性程度極差。請您針對評值分數未達 4 分的項目，請於修正意見欄或題目旁的空白處提供修正的寶貴意見。

中文版專業實務環境量表之可瞭解性、清晰性、及可閱讀性審查表

請圈選您所認爲可以反應出該題可瞭解性、清晰性、及可閱讀性程度的評值分數。

1.可瞭解性：指當讀者閱讀時，該項目的意思是否容易被瞭解的程度

評分等級:
4 分：該項目是容易被瞭解的
3 分：該項目需要再小幅度修正才能容易被瞭解
2 分：表示需要再大幅度修正才能容易被瞭解
1 分：該項目是不容易被瞭解的

2.清晰性：指該項目的措辭是否合宜的程度

評分等級:
4 分：該項目的措辭是合宜的
3 分：該項目的措辭需要再小幅度修正才是合宜的
2 分：該項目的措辭需要再大幅度修正才是合宜的
1 分：該項目的措辭是不合宜的

3.可閱讀性：指該項目是否容易被閱讀的程度

評分等級:
4 分：該項目是容易被閱讀的
3 分：該項目需要再小幅度修正才是容易被閱讀的
2 分：表示需要再大幅度修正才是容易被閱讀的
1 分：該項目是不容易被閱讀的

	可瞭解性	清晰性	可閱讀性	格式
首頁	1 2 3 4	1 2 3 4	1 2 3 4	□不需調整 □需要調整
研究參與同意書	1 2 3 4	1 2 3 4	1 2 3 4	□不需調整 □需要調整

中文版專業實務環境量表之可瞭解性、清晰性、及可閱讀性審查表

題目	可瞭解性	清晰性	可閱讀性	修正意見 (未達 4 分的項目，請提供寶貴意見)
1	1 2 3 4	1 2 3 4	1 2 3 4	
2	1 2 3 4	1 2 3 4	1 2 3 4	
3	1 2 3 4	1 2 3 4	1 2 3 4	
4	1 2 3 4	1 2 3 4	1 2 3 4	
5	1 2 3 4	1 2 3 4	1 2 3 4	
6	1 2 3 4	1 2 3 4	1 2 3 4	
7	1 2 3 4	1 2 3 4	1 2 3 4	
8	1 2 3 4	1 2 3 4	1 2 3 4	
9	1 2 3 4	1 2 3 4	1 2 3 4	
10	1 2 3 4	1 2 3 4	1 2 3 4	

Appendix M

Approvals from Institutional Review Boards

BOSTON COLLEGE
Institutional Review Board
Office for Human Research Participant Protection
Waul House, 2nd Floor
Phone: (617) 552-4778, fax: (617) 552-0948

IRB Protocol Number: 06.042.01

DATE: September 5, 2007

TO: Chia-Chuan Chang

CC: Dorothy Jones, Ph.D.

FROM: Institutional Review Board – Office for Human Research Participant Protection

RE: Development And Evaluation Of Psychometric Properties Of The Chinese Version Of The Professional Practice Environment Scale In Taiwan

Notice of IRB Review and Approval
Expedited Review as per Title 45 CFR Part 46.110, FR 60366, FR, # 7

The project identified above has been reviewed by the Boston College Institutional Review Board (IRB) for the Protection of Human Subjects in Research using an expedited review procedure. This is a minimal risk study. This approval is based on the assumption that the materials, including changes/clarifications that you submitted to the IRB contain a complete and accurate description of all the ways in which human subjects are involved in your research.

This approval is given with the following standard conditions:

1. You are approved to conduct this research only during the period of approval cited below;
2. You will conduct the research according to the plans and protocol submitted (approved copy enclosed);
3. You will immediately inform the Office for Human Research Participant Protection (OHRPP) of any injuries or adverse research events involving subjects;
4. You will immediately request approval from the IRB of any proposed changes in your research, and you will not initiate any changes until they have been reviewed and approved by the IRB;
5. You will only use the informed consent documents that have the IRB approval dates stamped on them;
6. You will give each research subject a copy of the informed consent document;

7. **If your research is anticipated to continue beyond the IRB approval dates, you must submit a Continuing Review Request to the IRB approximately 60 days prior to the IRB approval expiration date. Without continuing approval the Protocol will automatically expire on September 5, 2008.**

Additional Conditions: *Any research personnel that have not completed NIH certificates should be removed from the project until they have completed the training. When they have completed the training, you must submit a Protocol Revision and Amendment Form to add their names to the protocol, along with a copy of their NIH certificates.*

Approval Period: **September 5, 2007- September 4, 2008**

Boston College and the Office for Human Research Participant Protection appreciate your efforts to conduct research in compliance with Boston College Policy and the federal regulations that have been established to ensure the protection of human subjects in research. Thank you for your cooperation and patience with the IRB process.

Sincerely,

Christina Booth Steele, MS, CIPP
IRB Designee
Administrative Director

mg

09/02/03

PI's Last Name: Chang

Boston College Institutional Review Board
Office for Human Research Participant Protection
Carney Hall 116
Phone: 617-552-4778
FAX: 617-552-0948

APPLICATION FOR REVIEW OF RESEARCH PROPOSAL INVOLVING HUMAN PARTICIPANTS

(Cells will expand as needed)

DATE	July 21, 2005
New [x]	Resubmission [ ]

Principal Investigator (Last, First, Credentials)	Chia-Chuan Chang, RN, MSN, PhD (C)
Investigator Rank (e.g., Professor, Graduate Student)	Graduate Student (doctoral student)
Faculty/Staff Advisor (if appropriate)	Dr. Dorothy A. Jones, EdD, RNC, ANP, FAAN
Department or School	William F. Connell School of Nursing
Interoffice Address (or home address)	1856 Beacon street, Apt 2B, Brookline, MA 02445
Telephone Number	617-953-3956
E-mail address	changcf@bc.edu, chiachuanchang@yahoo.com.tw
Title of Project (If there is a sponsor, title must match the sponsored title)	Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan
Source of Funding	( ) University ( ) External (identify source and grant number) *Wait until you have been notified that your project will be funded before submitting protocol application to the IRB. Submit documentation of funding status with protocol application. *If federally funded, submit copy of the grant application to the IRB (x) None

Your signature below indicates that you accept responsibility and have followed the ethical guidelines set forth by the Belmont Report, Declaration of Helsinki, the Nuremberg Code, or the Ethical Principles of your discipline in developing the research described.

Chia-chuan Chang July 29/05

Signature of Principal Investigator Date

Your signature below affirms that a scientific review of this research has been conducted, and represents your approval of the research.

Lois A. Haggerty 7/29/05

Signature of Dept Chair or Dean Date

Your signature below affirms that you have reviewed this application and that you will oversee the project in its entirety, including any final or termination report.

Dorothy A. Jones 8/1/05

Signature of Faculty Advisor Date

Boston College IRB
Approved
SEP 06 2007
Thru Sep 06 2008

BOSTON COLLEGE
Institutional Review Board
Office for Human Research Participant Protection
Carney Hall, 116
ph: (617) 552-4778, fax: (617) 552-0948

NOTICE OF COMMITTEE REVIEW

Protocol Number: 06.042.01
Protocol Title: Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan
Principal Investigator: Chia-Chuan Chang
Dep't/School: Nursing
Funding Sponsor: None

[X] New Protocol [ ] Continuation Protocol

Type of IRB Review:

[ ] The protocol identified above was reviewed at the [INSERT DATE] meeting of the Boston College Institutional Review Board.
[X] The protocol identified above was reviewed through the expedited approval procedure of the Boston College Institutional Review Board.

This is to inform you of the following:

[ ] Protocol approved
[X] **Protocol conditionally approved pending receipt of an approval letter from Chang-Gung Memorial Hospital, Linkou Branch, located in Taiwan.**
[ ] Protocol deferred pending receipt of information requested in the attached list
[ ] Protocol disapproved for the reasons listed below

Comments:

Thank you for addressing all of the IRB's questions and comments. Please note that this protocol has been conditionally approved, which means that the issue listed above needs to be addressed before final IRB approval will be released.

Rachel Krebs
Administrative Director, Office for Human Research Participant Protection

9/7/05
Date

June 2, 2007

Boston College
William F. Connell School of Nursing
140 Commonwealth Ave.
Chestnut Hill, MA 02467
U.S.A

To Whom This May Concern,

This letter is to certificate that Chia-Chuan Chang is permitted to conduct her study, Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan, at Skin Kong Wu Ho-Su Memorial Hospital, Taiwan, R.O.C. We will act as intermediary by providing information about the study to eligible nurses.

Sincerely,

Yuanmay Chang

Yuanmay Chang, PhD, RN,
Director of Nursing Department
Skin Kong Wu Ho-Su Memorial Hospital
No.95, Wen-Chang Rd., Shihlin District,
Taipei 111, Taiwan, R.O.C.
Phone: 886-2-28332211

敏盛綜合醫院 Joint Commission INTERNATIONAL

June 1, 2007

Boston College William F. Connell School of Nursing
140 Commonwealth Ave.
Chestnut Hill, MA 02467
U.S.A

To Whom This May Concern,

This letter is to certificate that Chia-Chuan Chang is permitted to conduct her study, Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan, at Min-Sheng General Hospital Chin-Kuo Campus, Taiwan, R.O.C. We will act as intermediary by providing information about the study to eligible nurses.

Sincerely,

Suh-ER Shih, 施素娥

Suh-Er Shih, MSN, RN
Director of Nursing Department
Min-Sheng General Hospital
No.168, Ching-Kuo Rd, Taoyuan,
Taiwan, R.O.C.
Phone: 886-3-3179599

慈新醫院人體試驗委員會

Li Shin Institutional Review Board

July 27, 2007
Boston College
William F. Connell School of Nursing
140 Commonwealth Ave.
Chestnut Hill, MA 02467
U.S.A

To Whom This May Concern,

This letter is to certificate that Chia-Chuan Chang is permitted to conduct her study, Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan, at Li-Shin Hospital, Taiwan, R.O.C. We will act as intermediary by providing information about the study to eligible nurses.

Sincerely,

Wen-Shan Liao

Wen-Shan Liao
Chairman
Institutional Review Board of Li-Shin Hospital
77, Kuangtai Rd., Pingjen City,
Taoyuan County 324, Taiwan, R.O.C
Phone: 886-3-4941234

慈新醫院 2007. 7. 27 人體試驗委員會

June 1, 2007

Boston College
William F. Connell School of Nursing
140 Commonwealth Ave.
Chestnut Hill, MA 02467
U.S.A

To Whom This May Concern,

This letter is to certificate that Chia-Chuan Chang is permitted to conduct her study, Development and Evaluation of Psychometric Properties of the Chinese Version of the Professional Practice Environment Scale in Taiwan, at Yang Mei Ten Chen Hospital, Taiwan, R.O.C. We will act as intermediary by providing information about the study to eligible nurses.

Sincerely,

Han-Mei Chen

(主管名)
(主管職稱) Deputy Superintendent June 7, 2007
Yang Mei Ten Chen Hospital
No.356, Sec.1, Chung Shan North Rd., Yang Mei,
Taoyuan County 326, Taiwan, R.O.C.
Phone: 886-3-4782350

Appendix N

Survey Package

親愛的受訪者您好：

我是張嘉娟，我目前是就讀於美國波士頓學院(Boston College William F. Connell School of Nursing)的護理博士班學生。我的畢業論文是以發展及測試中文版專業實務環境量表(professional practice environment scale,簡稱 PPE Scale)爲主。

原版的專業實務環境量表是以英文撰寫且已經在美國麻州總醫院測試且被用來測量急性醫療體系的專業實務環境達四年之久。研究結果證實英文版的專業實務環境量表是份具有良好信效度的問卷。

爲了發展及測試中文版專業實務環境量表，原始的英文版專業實務環境量表必須翻譯成中文並且於台灣再度進行信效度的評量。目前英文版專業實務環境量表已經透過嚴謹的流程翻譯成中文，並且基於台灣文化的考量而修訂完成。

因爲您具有在急性照護體系工作的豐富經驗，我想邀請您參加我的博士畢業論文研究中的一項問卷調查作業。研究參與同意書及中文版專業實務環境量表檢附如後。您參與評值台灣護理人員的專業實務環境，對於發展出具有信效度且具有文化敏感度的中文版專業實務環境量表而言，是非常重要的一環。而您的見解也將非常有助於瞭解如何進一步改善台灣的護理專業實務環境。本研究相當重視您的意見。非常感謝您對本研究的支持與參與。如果您還有任何問題，歡迎隨時與我連絡。

敬祝　　健康快樂

美國波士頓學院護理博士班研究生
張嘉娟 敬啓
聯絡電話：0912084201
電子郵件： chiachuanchang@yahoo.com.tw

♥本研究呼應國際護理協會（International Council of Nurses, ICN）2007 年國際護士節宣導主題 “Positive Practice Environments：Quality Workplaces＝Quality Patient Care”
（正向的執業環境：優良職場＝優質照護）
懇請各位護理同仁支持及參與本研究♥

研 究 參 與 同 意 書

我是張嘉娟，美國波士頓學院護理博士班學生。在美國波士頓學院教授 Dr. Dorothy A. Jones 指導下，我正在進行畢業論文研究。我的研究題目爲：「中文版專業實務環境量表之發展與心理計量特性評值」。我想邀請您參加這個發展中文版專業實務環境量表的研究。您的參與絕對純屬自願性質。您絕對不會因爲拒絕參與而遭受任何處份或傷害。您可以自由地決定於任何時間停止參與本研究及保留您的資料。

您參與評值台灣護理人員的專業實務環境，對本研究以及未來相關研究的發展是非常重要的。未來，台灣的護理專業實務環境也可能因此而有機會切實地獲得改善。本研究將採用自填式的問卷，於民國 96 年 6 月 1 日至 7 月 30 日，針對護理人員進行調查以收集資料。問卷調查的目的是爲了收集台灣護理人員的專業實務環境現況。請您逐題閱讀中文版專業實務環境量表的每個題目後，依照您個人目前作單位的現況，圈選出一個最能表達您對問卷題目所陳述內容之同意或不同意程度的答案。作答問卷大約需花費 10-15 分鐘。

請您盡量於 14 日內回覆問卷。爲保護您的隱私，請將問卷放入檢附的不透明信封內再回覆給我。貴單位會設置一個問卷收集箱，以方便您回覆問卷。我每隔 7 天會更換收集箱，請您將回覆的問卷直接投遞於收集箱內。本研究發出問卷後的第 14 天、第 21 天，會再發函提醒受訪者繳回問卷。非常感謝您能儘早回覆。

參與本研究的唯一風險是，您可能會在作答時或作答後，感到沮喪、焦慮或疲憊。您可能會在作答時，因爲回想到自己曾經歷的不愉快事件，而出現情緒上的不適。本研究會保護您避免遭受這樣的風險。當您情緒出現不適時，請不要勉強作答。你隨時可以決定要休息或停止作答問卷。等您情緒舒緩後，再隨時繼續作答問卷。爲了降低您產生焦慮的風險，您會被詳細告知有關本研究的主題、目的、收案過程、風險以及福利。本研究採用匿名法以絕對保密您的個人隱私。爲避免您因作答感到疲憊，本研究提供您至少二星期的時間來作答問卷。

雖然本研究現在無法提供您任何福利，但是本研究結果可供改善台灣護理專業實務環境之參考。日後，病患、護理人員、護理研究、護理教育及護理專業將可能因此而受惠。爲感謝您的參與，本研究資料袋內附贈一份小禮物以作爲酬謝。

您可以於隨時停止參與本研究，絕對不會因爲拒絕參與而遭受任何處份或傷害。無論您何時決定停止參與本研究，您有權利保留任何您已經作答的資料及資料袋內附贈的小禮物。

您的個人隱私在本研究中將獲得絕對保密。爲了確保受訪者隱私，本研究問卷以匿名方式處理。您若同意參加本研究，只需回覆作答問卷即可，並不需要簽署同意書。爲了確保您的隱私，設置於　貴單位的問卷收集箱，將會安置於只有單位同仁有權進出的安全地點。此外，問卷收集箱將只留下約 10*2 公分的投入孔，以免問卷被他人取走。爲保障您的隱私及避免問卷遺失，問卷收集箱經由我彌封簽名後，將委請貴單位協助保管，除了我之外，絕不會讓任何人開封取閱問卷。

爲確保匿名及保密作業的進行，請您不要在問卷中提及任何同事的姓名。您作答的所有資料會受到嚴密的保護。未來本研究呈現資料時，絕對不會和任何受訪者姓名產生關聯。本研究所有資料只會以代碼或僞名呈現，絕對不會出現您的名字或個人基本屬性資料。您作答的所有資料也會安置於上鎖的文書櫃內，只有我的論文指導教授和我會取閱資料，絕對不會外洩給任何人。除了您的評論意見外，其他資料將只會以數字方式進行編碼及發表。您有權決定是否同意我在文章發表時引述您的評論意見。如果您同意我引述您的意見，我會用僞名以及刪除您評論意見中任何可能引發別人辨識您個人身分的文辭等方法，以絕對保護您的隱私。本研究成果報告後，您作答的問卷將會全數銷毀。

如果您對參與本研究的個人權益或研究設計有任何問題，歡迎與我連絡。本研究係依照美國波士頓學院 William F. Connell School of Nursing 博士學位結業之部分要求所建構。如果您有任何問題或評論，您可以致電 617-552-4058 聯絡我的論文指導教授 Dr. Dorothy A. Jones。本研究已由波士頓學院審查委員會核准，如果您認爲自己因爲參與本研究而遭受傷害，您可以致電 617-552-3344 聯絡波士頓學院研究行政中心。

根據以上內容，本研究的目的、資料收集過程、潛在風險及福利、報酬、退出研究、隱私權保護以及研究相關問題的解決方法等，已經詳細告知您。您閱讀並瞭解本份同意書所告知有關研究計計畫目的、您將被要求執行的事宜、您可以詢問問題及獲得滿意解答的途徑、您有權可以隨時中止參與本研究、以及您有權拒絕回答任何問題或保留個人作答資料等訊息後，您如果同意參與本研究，請您近日內就自己方便的時間內完成問卷。爲進行匿名作業以保護您的個人隱私，您回覆的問卷將取代簽署研究參與同意書，作爲您願意參與本研究的證明。衷心感謝您考慮參與本研究，感謝您的支持及參與。敬祝

工作順心

美國波士頓學院護理博士班研究生
張嘉娟 敬啓
聯絡電話：0912084201
電子郵件： chiachuanchang@yahoo.com.tw

專 業 實 務 環 境 量 表

說明

「專業實務環境量表」主要是調查您目前所處的護理工作環境現況。請您以自己目前工作單位現況爲考量，就題目所陳述的內容是否符合您個人的工作現況，圈選出一個最符合您實際情形的答案。

評值分數等級包含 4 級，滿分 4 分表示您對該題的陳述「非常同意」； 3 分表示您對該題的陳述「同意」；2 分表示您對該題的陳述「不同意」；1 分則表示您對該題的陳述「非常不同意」。您的答案代表您個人對問卷題目所陳述的內容的同意或不同意程度，絕對沒有所謂的對或錯之分，請您盡量完成每一題的作答。謝謝!

作答問卷依個人情況有所不同，前趨測試顯示大約需花費 10-15 分鐘。

專 業 實 務 環 境 量 表

請您逐題詳細閱讀後，以自己目前工作單位現況爲考量，就題目所陳述的內容是否符合您個人的工作現況，圈選出一個最符合您實際情形的答案。答案沒有所謂的對或錯之分。

題　目	非常同意	同意	不同意	非常不同意
1 領導階層支持護理。	4	3	2	1
2 在本單位裡，護理掌控了自己的專業實務。	4	3	2	1
3 我具有對病人照護和工作做重要決策的自由。	4	3	2	1
4 醫師和護理人員之間有很多團隊合作。	4	3	2	1
5 在本單位裡，病人照護的工作分派促進了照護的連續性。	4	3	2	1
6 本院有足夠的支持性服務(例如：社會服務部門、轉送中心、醫事部門..等)，使我能將時間放在病人身上。	4	3	2	1
7 我有足夠的時間和機會與其他的醫療人員討論照護病人的問題。	4	3	2	1
8 本單位有足夠的護理人員來提供具有品質的病人照護。	4	3	2	1
9 本單位的護理長是一個好的管理者和領導者。	4	3	2	1
10 本單位有足夠的護理人員來完成病人照護工作。	4	3	2	1
11 護理人員有機會在高專科性的病人照護單位工作。	4	3	2	1
12 即使護理人員的決定和醫生發生衝突，本單位的護理長也會支持護理人員。	4	3	2	1
13 醫師和本單位護理人員之間有良好的工作關係。	4	3	2	1
14 在本單位裡，我被要求要違背自己專業判斷來做事。	4	3	2	1
15 當我需要病人狀況的相關資訊時，我就能得到。	4	3	2	1
16 當病人的情況改變時，我能迅速得到相關的資訊。	4	3	2	1
17 本單位與醫院中其他團隊間具有良好的工作關係。	4	3	2	1

專 業 實 務 環 境 量 表

請您逐題詳細閱讀後，以自己目前工作單位現況爲考量，就題目所陳述的內容是否符合您個人的工作現況，圈選出一個最符合您實際情形的答案。答案沒有所謂的對或錯之分。

題　目	非常同意	同意	不同意	非常不同意
18 本單位沒有從醫院中其他的單位獲得所需的合作。	4	3	2	1
19 醫院中其他的單位似乎對本單位的評價不高。	4	3	2	1
20 和醫院中其他團隊的不良工作關係,限制了本單位的工作效益。	4	3	2	1
21 本單位的護理人員意見不合時，他們會忽略問題，假裝問題將會消失不見。	4	3	2	1
22 本單位的護理人員會從衝突中退出。	4	3	2	1
23 在本單位裡，在尋找問題的最佳解決方法時，所有的觀點都有被考慮。	4	3	2	1
24 本單位的所有護理人員都努力去達到最佳的可能解決方法。	4	3	2	1
25 在本單位裡，直到大家對決議感到滿意，涉及意見不和或衝突的相關護理人員才會平息紛爭。	4	3	2	1
26 本單位護理人員的經驗和專業知識，對達成高品質的衝突解決方法有所貢獻。	4	3	2	1
27 在本單位裡，護理人員之間的爭論會被忽略或被避免。	4	3	2	1
28 涉及意見不和或衝突的相關護理人員，以達成共識的方法來平息紛爭。	4	3	2	1
29 當我在這個單位工作時，我對自我的評價提升了。	4	3	2	1
30 當我把工作做好時，我覺得有很大的自我滿足感 。	4	3	2	1
31 我對自己所作的工作，感到有高度的自我責任感。	4	3	2	1
32 我擁有挑戰性的工作，激勵自己將工作做到最好。	4	3	2	1
33 在這個單位工作，讓我有機會獲得新的知識和技巧。	4	3	2	1

專 業 實 務 環 境 量 表

請您逐題詳細閱讀後，以自己目前工作單位現況爲考量，就題目所陳述的內容是否符合您個人的工作現況，圈選出一個最符合您實際情形的答案。答案沒有所謂的對或錯之分。

題　目	非常同意	同意	不同意	非常不同意
34 因爲我的工作環境激勵我，使我有動機將工作做好。	4	3	2	1
35 在這個環境工作，增強了我專業成長的感覺。	4	3	2	1
36 本單位的護理人員能獲得必須的資源，以提供顧及個案文化的合適照護。	4	3	2	1
37 本單位的護理人員對他們所服務的各式各樣病人族群，是感受敏銳的。	4	3	2	1
38 護理人員尊重其單位中多樣化的健康照護小組。	4	3	2	1
39 本單位的護理模式有助於護理人員充分發揮自己的專業能力。	4	3	2	1
40 在本單位裡，我對自己執行的護理實務具有掌控力。	4	3	2	1
41 本院的行政管理者，重視基層護理人員的意見。	4	3	2	1
42 在本單位裡，醫師和護理人員互相尊重彼此的專業。	4	3	2	1
43 在本單位裡，醫師認同護理人員對病患照護所做的貢獻。	4	3	2	1
44 在本單位裡，醫師和護理人員之間溝通良好。	4	3	2	1
45 在本單位裡，護理人員將病人的健康問題告知醫師時，醫師會有效率地處理問題。	4	3	2	1
46 在本單位裡，醫師與護理人員一同討論病人的情況與照護事宜。	4	3	2	1
47 我可以容易地聯絡到負責照護病人的相關醫療人員。	4	3	2	1
48 在本單位裡，病人的情況改變時，護理人員迅速通知相關的醫療人員。	4	3	2	1
49 在本單位裡，護理人員充分掌握自己負責照護的病人的狀況。	4	3	2	1

專 業 實 務 環 境 量 表

請您逐題詳細閱讀後，以自己目前工作單位現況爲考量，就題目所陳述的內容是否符合您個人的工作現況，圈選出一個最符合您實際情形的答案。答案沒有所謂的對或錯之分。

題　目	非常同意	同意	不同意	非常不同意
50 在本單位裡，護理人員之間正確且完整地交班病人的照護資訊。	4	3	2	1
51 本院有良好的資訊系統，可以快速將病患相關資訊傳輸給負責的醫療人員。	4	3	2	1
52 在本單位裡，護理人員之間具有良好的工作關係。	4	3	2	1
53 在本單位裡，護理人員之間互相合作以達成工作目標。	4	3	2	1
54 本院有文化議題的訓練或講座，協助護理人員瞭解不同的文化。	4	3	2	1
55 本院設有通譯服務，協助護理人員與病患溝通。	4	3	2	1
56 本院設有多語化（越南文、印尼文、泰文、英文等）的衛生保健教材，可供護理人員臨床使用。	4	3	2	1
57 本單位的護理人員尊重病人的價值觀或信念。	4	3	2	1
58 本單位的新進護理人員獲得充足的職前訓練。	4	3	2	1
59 本單位有臨床經驗豐富的護理人員擔任輔導員，引導新進護理人員。	4	3	2	1
60 我獲得充足的在職教育訓練。	4	3	2	1
61 本單位支持護理人員進修。	4	3	2	1
62 本單位支持護理人員參與學術會議或護理專業團體活動。	4	3	2	1
63 本單位的護理人員執行研究或專案改善時，可以充份獲得必須的資源。	4	3	2	1
64 本院護理圖書及期刊的質與量，可以滿足我的學習所需。	4	3	2	1
65 本單位醫療器材的質與量，可以滿足我照護病人所需。	4	3	2	1
66 護理長支持單位的護理人員。	4	3	2	1

基 本 資 料

本問卷採用不記名方式，您填寫的個人資料內容僅供研究分析之用，絕對不會被使用來識別您的身份或作其他用途。您的資料會被完全保密，請放心填寫每個欄位！

1.您目前的工作單位： (請註明單位名稱 如:5A)
□(1)病房_____ □(2)加護病房_____ □(3)急診_____.
□(4)開刀房_____ □(5)恢復室_____ □(6)其他_____.

2.您目前的工作職稱:□(1)護士 □(2)護理師 □(3)副護理長 □(4)專科護理師

3.您目前的工作職級：□(1)N0 □(2)N1 □(3)N3 □(4)N4 □(5)其他___(請註明)

4.年齡：_____足歲

5.性別：□(1)男 □(2)女

6.最高教育程度： □(1)專科 □(2)大學 □(3)碩士 □(4)博士

7.目前教育進修狀況： □(1)沒有在任何學校進修 □(2)學士學位進修中
□(3)碩士學位進修中 □(4)博士學位進修中

8.婚姻狀況：□(1)未婚 □(2)已婚 □(3)離婚或分居 □(4)鰥寡

9.擁有子女人數：_____.

10.同住子女人數：_____.

11.目前工作狀況：□(1)全職 □(2)兼職

12.目前工作身分：□(1)正式員工 □(2)約聘人員 □(3)部分工時人員

13.請問到目前爲止您已經擔任護理人員的年資：_____ 年_____ 月

14. 請問您已經在現在的工作單位中，擔任護理人員的年資：_____ 年_____ 月

15. 請問您已經在目前工作的醫院中，擔任護理人員的年資：_____ 年_____ 月

16. 您最常出勤的班別爲：
□(1)白班(08:00-16:00) □(2)小夜(16:00-24:00) □(3)大夜班(0:00-8:00)
□(4)三個班別平均輪替 □(5)其他_____(請註明)

17. 在您現職工作單位中，出勤以下三個班別時，您通常需要照顧的病患人數分別約爲：
(1)白班_____人 (2)小夜_____人 (3)大夜班_____人

18.平均來說，您每週出勤擔任護理人員的工作時數約：_____小時.

19.您目前的工作薪資所得，每月平均約新台幣：

□(1)20,000 元以下　□(2)20,001 元~25,000 元　□(3)25,001 元~30,000 元
□(4)30,001 元~35,000 元　□(5)35,001 元~40,000 元　□(6)40,001 元~45,000 元
□(7)45,001 元~50,000 元　□(8)50,001 元~55,000 元　□(9)55,001 元以上

20.您目前的護理工作薪資所得，是否爲家中經濟主要來源之一：□(1)否　□(2)是

以下資料將作爲輔助分析問卷調查結果。請您逐題閱讀後，勾選您的意見，並於空白處陳述個人看法。答案沒有所謂的對或錯之分，請您放心填寫。爲確保匿名作業之進行，請您不要提及任何同事的姓名。

本研究採用僞名，以及刪除評論意見中任何可能引發他人辨識受訪者身分的文辭等處理方法，以絕對保護您的隱私後，您是否同意研究者在成果發表時，引述您的評論內容?

(請勾選 您的意見)　□ 同意　□不同意

1.現有「專業實務環境量表」中，您認爲有沒有哪些題目<u>不適合</u>用來評量台灣的護理專業實務環境? □(1)沒有　□(2)有(若有，請說明。本研究修訂量表時會審慎採納您的意見)

2.您認爲有沒有哪些與台灣護理專業實務環境有關的重要議題，未來應該增納於量表之中? □(1)沒有　□(2)有(若有，請說明。本研究修訂量表時會審慎採納您的意見)

3.您對目前的護理專業工作環境，有什麼看法？

4.您覺得目前的護理專業工作環境，有什麼是迫切需要改善的？

5.您覺得目前的護理工作環境，有什麼是需要繼續保持的？

6. 整體而言，對於自己目前任職的這份護理工作，您覺得滿意的程度是：
□(1)非常不滿意 □(2)不滿意 □(3)尚可 □(4)滿意 □(5)非常滿意
爲什麼?.

7.整體而言，在您目前任職的單位內工作，您覺得滿意的程度是：
□(1)非常不滿意 □(2)不滿意 □(3)尚可 □(4)滿意 □(5)非常滿意
爲什麼?

8. 整體而言，您覺得自己目前任職的這份護理工作的工作負荷量是：
□(1)非常輕鬆 □(2)不沉重 □(3)沉重 □(4)非常沉重
爲什麼?

9. 整體而言，您覺得自己目前任職單位內，病患所獲得的護理照護品質是：
□(1)劣 □(2)差 □(3)不佳 □(4)可 □(5)佳 □(6)良 □(7)優
爲什麼?

10. 就您工作現況而言，當您所負責照顧的病患需要您協助時，您能即刻給予協助以滿足病人需求的情形爲：
□(1)很少能夠如此 □(2)偶爾能夠如此 □(3)經常能夠如此 □(4)總是能夠如此

11. 就您工作現況而言，您對所負責照顧病患能夠持續監控及觀察的情形爲：
□(1)很少能夠如此 □(2)偶爾能夠如此 □(3)經常能夠如此 □(4)總是能夠如此

12. 您覺得自己現職醫院內，護理部對護理人員在病患照顧上的貢獻，所認同程度是：
□(1)非常不認同 □(2)不認同 □(3)認同 □(4)非常認同

13. 您覺得自己現職醫院內，非護理單位對護理人員在病患照顧上的貢獻，所認同程度是：
□(1)非常不認同　□(2)不認同　□(3)認同　□(4)非常認同

14. 您覺得自己現職醫院內，護理部對護理專業實務的支持程度是：
□(1)非常不支持　□(2)不支持　□(3)支持　□(4)非常支持

15. 您覺得自己現職醫院內，非護理單位對護理專業實務的支持程度是：
□(1)非常不支持　□(2)不支持　□(3)支持　□(4)非常支持

16. 您是否曾考慮調任到現職醫院內的其他單位去擔任護理人員：
□(1)從未考慮 □(2)很少考慮 □(3)偶爾考慮 □(4)經常考慮 □(5)總是考慮

17. 您是否曾考慮調任到現職醫院內的其他單位去擔任技術人員：
□(1)從未考慮 □(2)很少考慮 □(3)偶爾考慮 □(4)經常考慮 □(5)總是考慮

18. 您是否曾考慮離職到別家醫院工作：
□(1)從未考慮 □(2)很少考慮 □(3)偶爾考慮 □(4)經常考慮 □(5)總是考慮

19. 您是否曾考慮不再從事護理工作：
□(1)從未考慮 □(2)很少考慮 □(3)偶爾考慮 □(4)經常考慮 □(5)總是考慮

問卷到此結束，感謝您的細心填答。本研究非常需要且相當重視您的意見，懇請您回覆問卷前，再次檢視是否均已完整作答。請將問卷放入檢附的信封彌封後，於 14 天內將問卷投入貴單位的問卷收集箱，謝謝！

感謝您的參與，讓我們一起爲創造正向的護理執業環境而努力，加油!
"Positive Practice Environments：Quality Workplaces＝Quality Patient Care"
正向的執業環境：優良職場＝優質照護
♥感謝您對本研究的支持♥

Appendix O

Remind Letters

回 覆 研 究 問 卷 提 醒 函

親愛的護理同仁您好：

本人非常誠摯地感謝您參與我的畢業論文研究:「中文版專業實務環境量表之發展與心理計量特性評值」。

如果您尚未完成問卷作答，但有興趣參與本研究，非常歡迎您能及早加入。您的意見非常有於協助本研究獲得更精確的結果。如果您的問卷已經不慎遺失了，歡迎您通知我再爲您補寄問卷。如果您對本研究有任何問題，歡迎與我連絡。

對於已經繳回問卷的受訪者，本人在此誠摯地向您致謝。感謝您願意在百忙之中撥空參與本研究。謝謝您的支持。敬祝

工作順利 身體健康

美國波士頓學院護理博士班研究生

張嘉娟 敬啓

聯絡電話：0912084201

電子郵件： chiachuanchang@yahoo.com.tw

研 究 結 案 通 知 函

親愛的護理同仁您好：

感謝您參與及支持我的畢業論文研究:「中文版專業實務環境量表之發展與心理計量特性評值」。本研究係依照美國波士頓學院 William F. Connell School of Nursing 博士學位結業之部分要求所建構。您的意見對本研究而言具有非常重大的意義，本研究將會因爲有更多護理人員的參與，而獲得更精確的研究結果。如果您尚未完成問卷作答，本研究還是非常歡迎您的加入。作答問卷大約需耽誤您 10-15 分鐘的時間。您的參與絕對純屬自願性質。您的個人隱私在本研究中將獲得絕對保密。身爲急性照護體系的臨床護理人員，您對本研究的參與，將非常有助於發展出具有信效度且具有文化敏感度的中文版專業實務環境量表，以及增加護理實務環境相關之知識。

如果您的問卷已經不慎遺失了，或是您對本研究有任何問題，歡迎您通知我再爲您補寄問卷或與您討論。如果您願意參與本研究，請您近日內就自己方便的時間內完成問卷作答後，將問卷放入檢附的信封內，直接投遞於 貴單位的問卷收集箱。

對於已經繳回問卷的受訪者，本人再次誠摯地向您致謝。感謝您願意在百忙之中撥空參與本研究。謝謝您的支持。

爲了改善台灣護理人員的專業實務環境，非常感謝您支持及參與本研究。敬祝

工作順利 身體健康

美國波士頓學院護理博士班研究生

張嘉娟 敬啓

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Appendix P

PCA Factor Loadings for the 64-Item ACPPE

Table P

PCA Factor Loadings for the 64-Item ACPPE (N=944)

Factor 1: Internal work motivation **Eigenvalue = 17.11** **% of variance explained= 6.94** **Cronbach's Alpha = .87**												
Item (n=7)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
32.I have challenging work to motivate me to do the best job.	.79											
34.I am motivated to do the best job because I am empowered by my work environment.	.75											
35.Working in this environment increases my feeling of professional growth.	.70											
33.Working in this unit gives me opportunity to gain new knowledge and skills.	.70											
31.I feel a high degree of personal responsibility for the work I do.	.69											
30.I feel a great sense of personal satisfaction when I do the job well.	.67											
29.My self-appraisal goes up when I work in this unit.	.51											

Table P (Continued)

Factor 2: Relationships between staff nurses and physicians **Eigenvalue = 3.54** **% of variance explained = 6.90** **Cronbach's Alpha = .88**												
Item (n=5)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
44. In this unit, doctors communicate well with nurses.		.77										
43. In this unit, doctors recognize nurses' contributions to patient care.		.74										
42. In this unit, doctors and nurses respect each others' profession.		.73										
13. There are good working relationships between doctors and nurses in this unit		.64										
46. In this unit, doctors discuss patients' condition and care with nurses.		.59										

Table P (continued)

Factor 3: Support for nursing professional development **Eigenvalue = 2.86** **% of variance explained = 5.94** **Cronbach's Alpha = .85**												
Item (n=6)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
60. I receive adequate in-service/continuous education.			.69									
62. This unit support nurses to attend conferences or professional activities.			.67									
59. There are experienced nurses serving as preceptors to guide the new nurses in t his unit.			.65									
61. This unit supports nurses to returns to school for degrees.			.54				.32					
58. New nurses in this unit receive adequate orientation.			.52									
63. When nurses in this unit perform researches or improvement projects, they adequately get necessary resources.			.52					.33				

Table P (continued)

Factor 4: Control over practice **Eigenvalue = 2.33** **% of variance explained = 5.61** **Cronbach's Alpha = .81**												
Item (n=5)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
8. This unit has enough staff nurses to provide quality patient care.				.78								
10.This unit has enough staff nurses to get the patient care work done.				.74								
7. I have sufficient time and opportunity to discuss patient care problems with other staff.				.62								
6. This hospital has enough support services such as social services department, transferring center, medical affairs division, etc. to allow me to spend time with patients.				.59								.31
11.Staff nurses have the opportunity to work in highly specialized patient care unit.				.47								

Table P (continued)

Factor 5: Interpersonal interaction **Eigenvalue = 2.09** **% of variance explained = 5.27** **Cronbach's Alpha = .79**												
Item (n= 7)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
21.When staff nurses in this unit disagree, they ignore the problem and pretend that the problem will go away.					.71							
19.Other hospital units seem to have a low opinion of this unit.					.70							
20.Inadequate working relationship with other hospital groups limits the effectiveness of work in this unit.					.70							
27. In this unit, disagreements between staff nurses are ignored or avoided.					.66							
18.This unit does not get the cooperation that it needs from other hospital units.					.63							
22.Staff nurses in this unit withdraw from conflict.					.59							
14. In this unit, I am asked to do things against my professional judgment.					.57							

Table P (continued)

Factor 6: Conflict management **Eigenvalue = 1.83** **% of variance explained = 4.66** **Cronbach's Alpha = .79**												
Item (n=7)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
52. In this unit, there is a good work relationship among nurses.			.31			.69					.31	
53. In this unit, nurses help one another to achieve work goals.			.35			.67					.35	
28. The staff nurses involved settle the disagreement by consensus.						.55						
26. The experience and professional knowledge of staff nurses in this unit contribute to achieve the high quality solution.						.55						
24.All staff nurses in this unit work hard to reach the best possible solution.						.48				.38		
25. In this unit, the staff nurses involved do not settle disagreement until they are all satisfied with the decision.						.39		.38				
23. In this unit, all points of views are considered in finding best solution to problems.				.32		.32						

Table P (continued)

Factor 7: Supportive leadership **Eigenvalue = 1.71** **% of variance explained = 4.26** **Cronbach's Alpha = .83**												
Item (n=3)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
9. Head nurse in this unit is a good manager and leader.							.77					
12. Head nurse in this unit backs up staff nurses' decisions even they are in conflict with doctors							.74					
66 Head nurse supports staff nurses in the unit							.69					

Table P (continued)

Factor 8: Support for professional practice **Eigenvalue = 1.52** **% of variance explained = 4.21** **Cronbach's Alpha = .73**												
Item (n=5)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
55. This hospital provides interpretation services to facilitate the communication between nurses and patients.								.73				
56. This hospital provides multilingual health care brochures/sheets for nurses in clinical practice								.58				
64. The quality and quantity of the collections in this hospital's library meet my learning needs.				.33				.55				
65. The quality and quantity of the health care facilities in this unit meet my needs in caring patients.			.34	.42				.38				
41. The administrators in this hospital value staff nurses' opinions.				.31			.33	.41				

Table P (continued)

Factor 9: Patient surveillance **Eigenvalue = 1.27** **% of variance explained = 4.03** **Cronbach's Alpha = .80**												
Item (n=6)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
48. In this unit, when the patient's condition changes, nurses quickly inform the involved medical staff in charge of the patients.									.70			
49. In this unit, nurses know very well their patients' conditions									.62			
47. I am able to easily contact the relevant medical staff in charge of the patients.		.40							.56			
50. In this unit, nurses give complete and accurate information about patients to colleagues during nursing shift report.						.37			.50			
51. This hospital has sound information systems to rapidly transfer patients' relevant information to the involved staff.									.46			
45.In this unit, when nurses inform doctors about patient's health problems, doctors manage the problem effectively.		.60							.37			

Table P (continued)

Factor 10: Nursing care **Eigenvalue = 1.23** **% of variance explained = 4.01** **Cronbach's Alpha = .77**												
Item (n=5)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
37. Staff nurses in this unit are sensitive to the diverse patient populations whom they serve.										.66		
38. Staff nurses respect their unit's diverse health care teams.										.65		
39. The models of care in this unit facilitate nurses to adequately demonstrate their professional competence.	.32									.56		
40. In this unit, I have control over my nursing practice.	.33									.46		
57. Nurses in this unit respect patients' values or believes			.50							.32		

Table P (continued)

Factor 11: Autonomy **Eigenvalue = 1.16** **% of variance explained = 3.82** **Cronbach's Alpha = .72**												
Item (n=5)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
2. In this unit, nursing controls its own professional practice.											.66	
3. I have freedom to make important patient care and work decisions.											.57	
5. In this unit, patient care assignments facilitate the continuity of patient care.											.55	
4. There is a lot of teamwork between staff nurses and doctors.		.35									.54	
1. Leadership supports nursing							32	.			.52	

Table P (continued)

Factor 12: Communication about patient care information **Eigenvalue = 1.11** **% of variance explained = 3.23** **Cronbach's Alpha = .71**												
Item (n=3)	Factor											
	1	2	3	4	5	6	7	8	9	10	11	12
15.I get information about patient's status when I need it.												.77
16.When patient's status changes, I get relevant information quickly.												.69
17.This unit has good working relationships with other groups in this hospital.		.31										.46